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DEMAND FOR HIGHER EDUCATION AND THE ROLE OF STARTING EARNINGS EXPECTATIONS: THE CASE OF FINAL-YEAR SECONDARY EDUCATION STUDENTS IN JORDAN

BY
IBRAHIM M. H. ALHAWARIN

A THESIS SUBMITTED TO THE NEWCASTLE BUSINESS SCHOOL NORTHUMBRIA UNIVERSITY IN PARTIAL FULFILMENT OF REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY (PH.D)

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ABSTRACT

This thesis examines the determinants of student demand for higher education (HE) in Jordan with special attention devoted to the role of expected rates of return (ERRs) to HE. In the context of economic theory, mainly Human Capital Theory (HCT), earnings expectations lie at the heart of students' post-secondary education decisions. Therefore, the study is primarily based on final-year secondary school students' HE decisions and starting earnings expectations. The starting earnings expectations are critically analysed and used to construct short-cut ERRs to HE. Also, comparisons between expected starting earnings and actual public sector starting wage rates are carried out.

The findings lend support to the economic explanations of demand and, in particular, the HCT predictions. Through applying logistic models, the study finds that ERRs influence students' post-secondary education decisions to enrol in HE positively. Students from low-income and large families are found to be less likely to consider continuing into HE. Consistent with the empirical literature, student academic ability is also reported to impact positively the likelihood to consider enrolment. Other variables such as parents' level of education and student's area of residence are proved not to be significantly associated with demand. Consumption value of education is greatly perceived, however, among both groups of the participants (i.e. those intending to undertake HE and those not). This indicates a weak prediction role of consumption motives in student demand for HE.

Overall, the analysis also indicates a strong role of education in determining students' starting earnings expectations. Furthermore, the calculated ERRs show females to expect higher return from HE than males, a pattern matching with the most recent Jordanian study of rates of return (RORs) to education (Talafeh, 2003). However, students appear to be overoptimistic regarding starting earnings for both secondary education and HE. In this regard, the analysis suggests that students do not base their starting earnings expectations on the current actual wage rates, a finding to consider in future RORs and ERRs and their link with demand for HE studies in the context of Jordan.

Based on the study's findings, various policy recommendations relating to demand for HE in Jordan are drawn. Better equitable HE provision may be achieved through

devoting more resources towards poor students, particularly those characterised with high-academic ability. Making students better-informed about HE and labour market return and conditions may also enhance the efficiency of individual decisions on HE and contribute to alleviating the mismatch between HE and the labour market in the country.

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DEDICATION

I dedicate this thesis to my parents, wife and uncle Haroon. Also, I would like to dedicate it to my brothers, sisters and daughter Jana.

DECLARATION

I certify that this work has not been accepted in substance for any degree and is not concurrently submitted for any degree other than that of Doctor of Philosophy of the Northumbria University. I also declare that this is the result of my own investigation except where otherwise

Signature of Student: ……

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LIST OF ABBREVIATIONS

CBJ	Central Bank of Jordan
CSS	Civil Service System
DOS	Department of Statistics
ERRs	Expected Rates of Return to Education
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNP	Gross National Product
GSEC	General Secondary Exam Certificate
HCT	Human Capital Theory
HE	Higher Education
HEC	Higher Education Council
IMF	International Monterey Fund
JD	Jordanian Dinar
LMI	Lower-Middle Income Countries
MENA	Middle East and North Africa group
MOE	Ministry of Education
MOHE	Ministry of Higher Education
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least Squares regression
QLFS	Quarterly Labour Force Survey
RORs	Rates of Return to Education
SSH	Signalling-screening hypothesis
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UNRWA	United Nations Relief and Work Agency for Palestine Refugees in the Near East
US$	American Dollar
WB	World Bank
WTO	World Trade Organization

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Despite macroeconomic restructuring and reform which started in 1989, Jordan still suffers from two ongoing problems, namely, poverty and unemployment. With respect to poverty, a significant proportion of the population lives under the poverty line. Unemployment, which is particularly acute among young adults, averages around 14%. The economy's ability to generate employment is currently not keeping pace with the large numbers graduating from higher education (HE), where the Kingdom has witnessed noticeable expansion in both supply and demand since 1990. Many new public universities have been established and student demand for HE, especially in the public institutions, has increased rapidly and is expected to rise further over the next decade (UNESCO Institute for Statistics & OECD, 2005). Due to this increase, a growing number of private universities have entered the market since the early 1990s. There are currently almost twice as many of these as public universities, and they host around 30% of all university students. The increasing demand and budgetary pressures have resulted in constraining the government's capability of continuing its policy of offering a largely subsidised HE. Hence, HE finance policy is experiencing major changes focusing on switching towards the adoption of a cost-sharing strategy, which involves gradually shifting more of the costs of HE onto students. As a result of this policy, concerns about equality in HE provision have arisen. The student support system is rather weak, despite the fact that the government has initiated a new student fund which is supposed to be financed from the decreased public subsidy for HE.

Despite the above-mentioned facts, there is a strange paucity of research on the variables driving students to demand HE. There has been, to the best of the present researcher's knowledge, only one study in this field (Bani Essa, 1995). Its author concluded that the country would face high levels of demand in the future. Bani Essa argued that the issue of demand for HE must be studied more deeply in order to achieve a better understanding of student behaviour towards HE. In general, from the use of cross-sectional data collected from a sample of secondary schools, Bani Essa emphasized the role of family income and parents' level of education in determining demand (see Chapter Five). However, his study focused only on one rural area within one of the northern provinces, and also it did not examine the role of earnings expectations and other important variables.

On the other hand, work on the rates of return (RORs) to education has similarly not been given a great deal of attention. The latest study, by Talafeh (2003), identified relatively high RORs to HE in Jordan, suggesting that this fact could have contributed in fuelling student demand for HE. However, such a suggestion has not yet been investigated either using RORs or expected rates of return (ERRs) to education.

The present study is thus an attempt to fill this gap in the literature by exploring the variables influencing student demand for HE in Jordan, placing special emphasis on the role of ERRs by analysing students' earnings expectations.

The next section provides a brief summary of the economic interpretation of why individuals demand education and HE (Chapter Four gives more details).

1.1.1 Student demand for HE and economic theory

The concept of 'human capital', which originated with Adam Smith, emerged at the centre of the economic theory of expenditure on education in the late 1950s. The work of Schultz (1961) is considered the beginning of Human Capital Theory (HCT), which has been intensively embraced by economists to explain microeconomic behaviour regarding education, health, training, and other forms of human behaviour. In relation to education activities, HCT proposes that education has the potential to enhance one's productivity and consequently lifetime earnings (Johnes, 1993). This notion has been supported empirically. This is demonstrated in early statements such as:

> Probably the most impressive piece of evidence is that more highly educated and skilled persons almost always tend to earn more than others (Becker, 1975, p. 10).

Psacharopoulos & Patrinos (2004) have recently reaffirmed this by reviewing cross-country evidence on RORs. In effect, HCT explains the distribution of earnings as a result of differential returns from public and private investment in human capital, particularly education. Public expenditure on education is widely seen as a form of investment in human capital that is theorised to increase national productivity and economic competitiveness, and in effect economic growth, and to combat economic inequalities (such as poverty). Therefore, RORs have been viewed as an effective policy tool to allocate public resources and to observe the efficiency and equity of education policy.

On the other hand, at the micro level, students are theorised by HCT as economic actors who make their decisions on demanding HE based on rationally weighing up the benefits of participation in HE, primarily in terms of differentials in earnings, against

the costs of participation, including the cost of earnings foregone by remaining in HE. HCT assumes that students realise the relationship between more education and gaining more earnings and subsequently act upon this realisation. Therefore, expectations of earnings lie at the heart of HCT (Webbink & Hartog, 2004) and ERR is the prime incentive for individuals to continue into HE, which can be used as a parameter to explain and predict student demand for HE. However, ERRs are in practice approximated by RORs. Relatively little attention has been paid to examining students' earnings expectations and their influence on student demand for HE (See Chapter Five). As mentioned above, Talafeh (2003) suggests that this relationship between returns to HE and demand exists in Jordan; however, it has not yet been empirically examined.

In spite of the fact that the HCT is the dominant theory in this field and is widely supported by empirical work across countries and time, other theories have challenged its dominance. Signalling-screening hypothesis (SSH), or sorting theory, which is seen by some economists as an extension of HCT (Weiss, 1995), is the main rival. This offers an alternative explanation revolving around two notions: firstly that students demand HE in order to signal their native ability; and secondly that employers use education as a device to sort employees according to their ability. Put differently, according to SSH (actually according to its strong version) education does not at all enhance productivity, but due to imperfections in information, it exists as an information device. The weak version of this theory, however, accepts that education plays two tasks (i.e. an information device and a productivity-enhancing method).

Nonetheless, in spite of the different interpretations of why employers pay more for more educated people, HCT and SSH tend not to conflict much over the hypothesis that

students rationally demand HE based on their earnings expectations (Psacharopoulos, 1979; Weiss, 1995).

In the next section, the methodology and objectives of the present study are introduced more clearly.

1.2 The research objectives and methodology

The current study attempts to contribute to the understanding of student demand for HE in Jordan and the influence of ERRs in the latter. It is based on investigating students' decisions when they are about to enter HE rather than after the decisions have been made. This approach was expected to be more appealing from a theoretical point of view and possibly therefore give a better understanding of student demand for HE. The study gathered data on earnings expectations and post-secondary education from secondary school students in Jordan. This strategy is used to measure directly the association between expected rewards and demand for HE which is assumed by economic theory.

1.2.1 Objectives of the study

The study specifically has two main objectives and three secondary but important parallel ones:

The main objectives of the study are:

1. To investigate empirically the variables influencing student demand for HE, particularly the role of the ERRs to HE, as proposed by economic theory. The other main economic variables suggested by the literature

include: consumption motives, family background variables (specifically income and parental education), student ability (approximated by students' average marks), and number of siblings or family size. Other variables related to the labour market and HE in Jordan are investigated as well.

2. To measure ERRs to HE drawing on final-year secondary education students' starting earnings expectations, using the short-cut method.

The secondary objectives are:

1. To investigate empirically regional and gender differences in ERRs and demand for HE.
2. To investigate empirically whether students make their earnings expectations based on the current prevailing observed earnings. This is carried out by using a simple comparison between students' starting earnings expectations with the starting earnings assigned by the public sector.
3. To draw out some policy recommendations based on the study's findings that may be especially informative and useful regarding HE and demand for HE in Jordan.

1.2.2 Methodology and sources of data

Primary data were collected on earnings expectations and other dimensions relating to work and HE utilising a self-completion questionnaire distributed face-to-face in a sample of secondary schools in one of Jordan's twelve governorates. Also, different types of secondary data were collected for the purpose of describing the Jordanian

economy and education system, and in examining to what extent students' earnings expectations deviate from prevailing earning rates.

As shown above, the economic interpretation of student demand for HE emphasizes the impact of investment spirit (simply put, comparing the benefits of HE with its costs). Therefore, individuals are assumed to make some kind of rate of return calculation by weighing up the benefits - in this case the difference between earnings expectations placed on employments with only secondary education/with HE - against the costs of education, including the earnings foregone by students while remaining in HE. In the case of using earnings expectations, such a calculation is called ERR to distinguish it from the other type, ROR estimation, which applies earnings realisations.

The approach adopted in the study to measure ERR is based on the short-cut method, first developed and used by Psacharopoulos & Sanyal (1981), and used in later studies (Hung et al, 2000; Menon, 1997a; Psacharopoulos & Sanyal, 1982). This method requires fewer subjective earnings expectations. The method draws only on differences in starting earnings expectations to approximately measure the ERRs to HE. This method was adopted mainly due to the fact that it would allow the collection of data of better quality given the time and resources available for the study (see Chapter Six).

To fulfil the requirements of the short-cut method, the questionnaire asked the participants to reveal their expectations on starting earnings for HE and secondary education. The difference in earnings between employment with secondary education

and with HE perceived by each respondent was utilised in the calculation of ERRs. Measured ERRs were also used in the examination of student demand for HE.

To examine student demand for HE, logistic regression techniques were applied due to the dichotomous nature of the dependent variable. In this respect, in order to proxy for student demand for HE, the students were asked to report their *most likely post-secondary decisions* (i.e. to continue into HE or to seek employment). Hence, throughout the methodology and analysis chapters, students are divided according to their most likely decisions into a *demand group* and an *employment group*. Besides its inquiry into earnings expectations and post-secondary decisions, the questionnaire contained several other types of questions relevant to the purposes of this study. The questionnaire asks about explanatory variables such as family monthly income, parental education, average marks, number of siblings and number of siblings undertaking HE.

In addition to logistic regression, simultaneous and stepwise multiple regression techniques (Ordinary Least Squares (OLS) regression), one-sample *t* tests, and descriptive statistics were used in the analysis of the collected data.

1.3 What is distinctive about the current study?

In Jordan, the economic literature on returns to education and their link with student demand for HE is in general underdeveloped. Above all, there has been no attempt to empirically examine the influence of earnings expectations possessed by students on their decisions to demand HE. Therefore, the current study is original with respect to this issue. In addition, the study makes four fundamental contributions:

1. This is the first empirical Jordanian study to measure ERRs based on earnings expectations perceived by final-year secondary students.
2. HE in Jordan has witnessed a profound expansion in both the supply and demand sides, coupled with a substantial increase in the private costs borne by students and their families. Thus, this study provides empirical evidence to help in better understanding the variables motivating the demand side and in enhancing the equality of education provision.
3. This study is the first empirical study in Jordan to hold a comparison, albeit based on a simple method, between earnings perceived by students and those prevailing in the labour market.
4. The study also implies testing the investment component of education (i.e. the link between demand and ERRs) which is assumed by economic theory.

1.4 Limitations of the study

Due to limited time and resources available for the study, the data were collected from one governorate in Jordan, this is AlKarak, which lies in the middle of the kingdom and is characterised by features making it arguably a good representative of the whole country, especially if one considers that the study involves a relatively large and representative sample. Therefore, although the results of the current study apply best to AlKarak governorate, they could also be to a great extent generalised for the whole country. The current sample size is similar to that used by Bani Essa (1995), however, it takes into account the degrees of urbanisation prevailing in the country and influencing education policy on HE. Therefore, the research attempted to collect representative samples from the three areas (i.e. urban, rural and nomadic). Yet, despite the researcher's efforts to draw a representative sample (see Chapter Six) the sample cannot

be considered as fully random. This was due mainly to the fact that the sample elements, the students, are not statistically observable, unlike schools, on which the random selection was based.

Two pilot studies were conducted prior to the main fieldwork, leading to redesigning the questionnaire to be shorter, more workable and time manageable. Also, during the primary data collection process, all reasonable means were used to motivate the respondents to participate in the study and answer the questions honestly. However, as with most survey-based research, the responses on self-report measures cannot be expected to always be completely true and accurate. On this point, one should note that this study is based on subjective expectations of post-secondary education. While this is hoped to reflect more reliably why students demand HE, it is not expected to completely grasp the actual picture of demand in Jordan and its distribution (for example by gender, area, social background, HE specialisation).

The design of the questionnaire, which of course determines the quantity and quality of the data, was influenced by various practical and institutional factors. For example, it was required officially not to consume more than 35 minutes of students' class time. As a result, it was realised from the pilot studies that asking students several times about earnings expectations, would not only result in making the questionnaire much longer but would also affect the quality of the data by making the process of completion much more boring. Therefore, the study relied on students' expected starting earnings only and consequently used the short-cut method of ERRs, which produces an approximation of the return. Chapter Six is concerned with the methodology of the study and gives more details on the techniques used.

1.5 Outline of the study

The thesis is divided into nine chapters including this introduction. Chapter Two presents an overview of Jordan and its economy, which lies in the Middle East and is characterised by a vulnerable small economy and high unemployment rates ranging around 14%. Chapter Three is devoted to examining the education system in Jordan. Chapter Four discusses the theoretical economic interpretation of demand for HE focusing most of the attention on the simple model of HCT, which theorises students as economic agents whose decisions on education are determined by the returns they expect. Empirical studies that have analysed earnings expectations drawn out from students are critically considered in Chapter Five, paying particular attention to those studies measuring ERRs using various methods. The role of ERRs and other variables in determining enrolment or demand decisions are also highlighted as well in Chapter Five. This includes not only research applying earnings expectations, but also studies using other approaches. Chapter Six is concerned with the methodology adopted in the present study and offers details on the short-cut method and logistic regression techniques. The empirical analysis in the study consists of two parts. The first part, presented in Chapter Seven, is concerned with measuring ERRs and analysing earnings expectations. Chapter Eight presents the second part which utilises logistic regression techniques to estimate the variables influencing post-secondary education decisions (i.e. student demand for HE). Finally, Chapter Nine summarises the study's findings and provides conclusions and policy recommendations along with some suggestions for future research.

CHAPTER TWO

JORDAN AND ITS ECONOMY

2.1 Introduction

Jordan is a small middle-eastern open economy characterised by limited natural resources and a noticeable dependency on external financial inflows, particularly foreign aid, foreign debt and workers' remittances. Internationally, Jordan is classified as a lower-middle income economy. Since 1989, it has implemented an ambitious programme of economic reform with the support of the International Monetary Fund (IMF) and the World Bank (WB), to restructure the economy aiming generally to boost economic growth and alleviate the ongoing socio-economic challenges (i.e. poverty and unemployment). However, the country continues to suffer from the latter two problems.

The current chapter provides general information on Jordan and its economy. It briefly describes the country's economic and political history, its macroeconomic characteristics and the socio-economic problems challenging the Jordan economy.

2.2 Jordan's geography

The Hashemite Kingdom of Jordan is situated at the junction of the Levantine and Arabian areas of the Middle East. It is bordered to the west by Israel and Palestine, with Saudi Arabia and Iraq to the east, Syria to the north and Saudi Arabia and the Aqaba Gulf to the south. The total area of Jordan is approximately 89.3 thousand km^2 of which just 7.8% is suited for agricultural use, and the remainder is uncultivated lands comprised of either desert or small hills (Department of Statistics (DOS), 2001). Geographically, Jordan can be divided into three main areas hosting the twelve

governorates constituting the administrative body of the kingdom: the Jordan Valley, the Highlands Region and the Desert Region.

The Jordan Valley extends from the north to south separating Jordan from Israel and the occupied West Bank. It contains the most fertile region in Jordan, called in Arabic *Ghor*. Through this area runs the Jordan River, which rises from several sources mainly from the Lebanon Mountains in Lebanon, flowing down into Lake Tiberias then emptying into the Dead Sea. The Dead Sea is 407 meters below sea level and is known to be the lowest point on the earth's surface. South of the Dead Sea runs the Jordan Valley through the hot Wadi Araba to the southern city of Aqaba.

The Highlands region, which separates the Jordan Valley from the Desert Region, extends from the northern borders to the Aqaba Gulf in the south. This part of the country hosts the main Jordanian cities; the capital city of Amman, Az-Zarka, Irbid, As-Salet, Ajloun, Jerash, Madaba, AlKarak and AlTafilah.

The Desert Region comprises approximately 70% of the total area of Jordan (DOS, 2001). This area occupies completely the eastern and south-eastern parts, including the cities of Ma'an and AlMafraq.

Appendix 1 is a descriptive map of Jordan showing the areas of Jordan, the area of each governorate and Jordan's political borders.

2.3 Jordan's population

The population of Jordan was around 5 millions in 2002, of which 52% are males (see Table 2.1). The annual population growth rate in 2002 reached 2.8% compared with 1.9% and 0.8% for the developing and OECD countries respectively (Al-sana'a & Wadee, 2003). Around 78% of Jordanians live in urban areas, while the remainder reside in the rural and nomadic areas (DOS, 2002).

Life expectancy at birth, in 2002 averaged 70.6 and 72.4 years for males and females respectively. Crude death rate (per 1000 population) and infant morality rate (per 1000 live births) are 5 and 22.1 respectively (DOS, 2002). The average household size is around 5.8, with an economic dependency ratio which measures the number of nonworking people that the working population supports of 2.6 (World Bank, 2005). This ratio is one of the highest in the developing countries, and is higher than those prevailing in other regional countries in the Middle East and North Africa region (MENA) (World Bank, 2005). One possible explanation of this high ratio is the low female labour force participation (see also section 2.6.1).

Jordan's official language is Arabic. English which has been decided recently to be taught from the early stages of schooling is widely used, especially among academics and in the tourism areas. Around 94% of Jordanians are Arab Muslims, while the rest are (nearly 6%) are Arab Christians.

2.4 Economic and political history

2.4.1 Period of British Mandate (1921-1946)

Jordan was founded as a separate state in 1921 as a result of the Great Arab Revolution against the Ottoman Empire, which started in 1916 during the First World War. Ottomans had ruled the country since the sixteenth century until the establishment of Trans-Jordan, which is the old name of Jordan, by King Abdullah I. However, the region then came under further foreign interference, when Trans-Jordan was decided to be governed by Britain. Generally speaking, agriculture, including farming and livestock raising, was the dominant economic sector in this era. Other economic activities were much less developed and sectors such as heavy industry did not exist. Small industries such as handicrafts, and service activities based on foreign tourists and passing-to-Mecca Muslim pilgrims existed but made little contribution to national output. Public revenues in this period depended mainly on two resources, namely, British aid and taxes (Carroll, 2003). The internal resources could not cover the developmental requirements for the country; therefore, British subsidies constituted a significant fraction of the public budget, varying between half and 30% of public expenditure, and lasting until the end of the 1955 (Carroll, 2003).

The British mandate of Jordan lasted until the 25th of May 1946, when Jordan obtained its independence, transforming the country from being an emirate into a kingdom called the Hashemite Kingdom of Jordan. However, the country remained for many years after independence under British tutelage. Arab and American aid, however, from 1955 onwards has substituted for British assistance (Lavy & Sheffer, 1991).

2.4.2 Period (1946 –1967)

Soon after independence, Jordan started to witness a period of political instability. Important events included the assassination of King Abdullah I in Palestine in 1950 and the first Arab-Israeli war in 1948. The war resulted in a huge influx of Palestinian refugees to Jordan, almost tripling its population at that time (Abdallah, 1994) and leading to unexpected heavy increases in demand for public services, infrastructure and military needs. The war also led politically to the unification of Jordan and the West Bank shortly before the assassination of the king. In 1950, King Talal's reign started, lasting however for only two years. This era witnessed the initiation of the Jordanian constitution in 1952, which is still in force now. The constitution states that the ruling regime is parliamentary, with a hereditary monarchy in King Abdullah's family (the Hashemite family). In 1953, King Hussein's reign began, which lasted for forty-six years until early 1999.

In the early 1950s, the economy began to switch gradually from its limited agricultural orientation to being more services based (Piro, 1998). The services sector, alongside mining and manufacturing, grew gradually as a result of heavy governmental investment and the availability of skilled human resources, mainly in trade and services, among the Palestinian refugees. By 1961, workers in the services sector constituted almost 45% of the labour force of Jordan (Gubser, 1983).

This period was marked with remarkably high average growth rates in the Gross National Product (GNP), which briskly grew at an annual rate of 11% during the period 1954-1967 (Gubser, 1983). Also, it witnessed the introduction of the first Five-year plan

in Jordan (1963-1967), which, although unfortunately disrupted by the 1967 Arab-Israeli war, marked the beginning of socio-economic planning in Jordan.

2.4.3 Period (1967-1973)

In 1967, the second Arab-Israeli war took place, leading to another huge influx of people from the West Bank to Jordan accompanied by the loss of the productive land of the West Bank. In 1970-1971, matters came to a head as result of the civil war that erupted between militants from the Palestinian refugees and the Government. Having restored civil peace, the country then suffered the consequences of the 1973-Arab Israeli War. These incidences collectively resulted in a notable increase in public expenditure, which grew during the period 1967-1972 by an annual average of 8.3% (Zioud, 1996).

The government had to try to respond to these most turbulent times. Therefore, a new socio-economic plan was introduced in 1972 (the Three-year plan of 1973-1975) aiming primarily to remedy the socio-economic problems resulting from the earlier wars (Mazur, 1979).

Nevertheless, Gross Domestic Product (GDP) recorded an annual growth rate of 6.5% in this period, whereas the per capita figure remained stable due to the influx of more than 200,000 refugees from the recently-occupied West Bank (Mishal et al, 2001).

2.4.4 Period (1974-1983)

The economy experienced rapid expansion, stability and prosperity over this period. Real GDP grew substantially at an average annual rate of 10% (World Bank, 1998). This was mainly due to the extraordinary explosion of oil prices in 1973, which

reflected positively on Jordan's economy through unpreceded levels of aid and soft loans from the Gulf-oil producing Arab countries. The expansion and rapid development in the booming Gulf economies led to extensive job opportunities, which attracted a significant proportion of the Jordanian labour force to work there (Day, 1986). Consequently, the unemployment rate declined to around 1.6% or less (Talafeh, 2003). As a result, workers' remittances then became one of the main sources of foreign currency required to stabilise the local currency and to finance imports. Foreign inflows specifically from external aid and workers' remittances, constituted 58% of GDP during the period 1974-1982 (Mishal et al, 2001).

However, beginning in this era, the Jordanian economy started to import foreign workers, especially from Egypt, to bridge the gap between supply and demand for its own labour force, which then contributed to mounting unemployment rates in later years.

In 1981, the Iraqi-Iranian war began, lasting for eight years. In spite of the political instability caused by this war, Jordan did reap some economic benefits. Firstly, the war led Iraq to depend entirely on Aqaba Port for imports to meet its civil and military needs, which raised the revenues from the shipping fees at the port. Simultaneously, this situation energised the transport sector in Jordan, resulting in the hiring of a considerable number of Jordanians in this sector. Secondly, due to the difficulties that faced by the Iraqi manufacturing sector during the war, Iraqi demand for industrial imports from Jordan substantially increased.

2.4.5 Period (1983-1989)

In the aftermath of the collapse of world oil prices at the beginning of 1980s, the GDP growth rate fell noticeably in real terms to 2.5% between 1983 and 1987 (Central Bank of Jordan (CBJ), 1996). Mishal et al (2001) mentioned that the steep decline in oil prices in aid-providing countries caused a dramatic decrease in external aid directed to support the Jordanian economy (from US$ 1.1 billion in 1981 to less than US$ 600 million in 1989). Also, of course, the remittances of Jordanians abroad dropped as a result of the shrinkage of labour demand in the Gulf region.

In the mid-1980s Jordan began to rely excessively on borrowing domestically and internationally to help the government to meet its budgetary requirements. The deficit in the general budget expanded to around 25% of GDP in 1988, raising external debt to the very high level of 190% of GDP. During this period, the situation continued to deteriorate as the foreign reserves of the CBJ were gradually withdrawn to help the country bridge the gap between export and import values. Simultaneously, the economy was suffering from negative domestic savings levels which widened the crisis. These circumstances led the country to a serious financial crisis in 1988 coupled with riots in April 1989, resulting in a 25% inflation rate and a 60% devaluation of the Jordanian currency. GDP growth also declined for the first time to negative values (-3.7 and -16.7 in 1988 and 1989 respectively).

2.4.6 Period (1990-2004)

The economic collapse experienced by the country in the late 1980s forced the government to negotiate debt-rescheduling with the IMF, which in turn agreed to do so conditional upon the country's adoption of economic restructuring and reform

programmes. The first programme, which aimed to initially recover the economy, was aimed to run over the period 1989-1993. However, in 1990 this programme was disrupted by the Iraqi invasion of Kuwait, leading to the return of 300 thousand Jordanians from the Gulf and raising the unemployment rate to a high record of around 20% (Feiler, 1993).

Two IMF-supported structural programmes followed the above developments, aiming primarily to alleviate the government's poor management of the economy and to develop the country's productive base with the private sector as the engine of investment and employment (Piro, 1998). The first programme was targeted for the period from 1992-1998. However, this did not achieve most of its goals, and so a second programme was initiated for the period 1999-2001 which was then extended to cover the period 2002-2004.

During the period from 1990-2004, many legislative and structural changes towards economic liberalisation were successfully undertaken. For example, the government introduced a new act for investment which allowed full foreign ownership in most economic sectors, restructured the tax system, and eliminated all barriers on the movement of financial assets from and to the country (CBJ, 2000). Such adjustments made the economy perform satisfactorily; GDP grew at an average of 5.2% in real terms for 1992-1995. High economic expectations also accompanied the Jordan-Israeli peace process and the consequent peace treaty of October 1994. Jordanian official economists anticipated that the treaty would help Jordan obtain more economic aid, especially from the USA, and result in booming internal and foreign investment. "However, peace was

to prove an economic disappointment, providing little aid, few export opportunities and much less investment than was hoped for" (Carroll, 2003, p. 220).

In the period from 1996-1998, the Jordanian economy was extremely vulnerable to external shocks. In spite of the tight economic policies, the economy in this period experienced a deep state of economic recession. This was caused by the partial loss of the Iraqi market, the crash in oil prices and the disappointment and uncertainty surrounding the Israeli-Palestinian peace process (Akel, 1999). These variables, combined with the heavy debt burden and the fiscal deficit, negatively affected the balance of payments. Accordingly, the rate of domestic and foreign investment slowed down, and real economic growth fell substantially to 1.9%, 3.6% and 3.1% in 1996, 1997 and 1998, respectively.

King Hussein passed away in February 1999 leaving the leadership to his successor King Abdullah II. Fortunately, Jordan overcame this crisis very smoothly in spite of many pessimistic expectations regarding its consequent political effects on Jordan's future. The period 1999-2004 witnessed remarkable economic performance in terms of real economic growth. Table 2.1 shows that GDP at constant prices grew on average about 5.7% annually. This resulted in an increasing real annual per capita income from around Jordanian Dinar (JD) 1155 (US$ 1628) in 2000 to JD 1261 (US$ 1777) in 2004. Then after the eruption of the Palestinian Intifada (uprising) in 2000 and the 11th of September events in 2001, Jordan's economy faced some short-term difficulties. However, according to Mahdi (2002), it successfully weathered the impact of these two events in terms of economic growth. Since 2000, Jordan has undertaken many important steps hoping to positively influence economic performance, especially in the exports

sector. It acceded to the World Trade Organization (WTO), signed a Free Trade Area agreement with the USA, activated the association agreement with the European Union which was signed in 1997, established the Aqaba Special Economic Zone and reviewed its laws of intellectual property rights and investment. It is hoped that these further steps will facilitate capital movement to the country and increase foreign direct investment (FDI), which will assist the country in creating more employment. To succeed in attracting more FDI, however, the country must place more emphasis on its education system to alleviate the mismatch between the skills produced and those demanded by the labour market and new foreign investors.

Table 2.1: GDP in constant prices (1994=100), real growth rates and real GDP per capita in Jordan for 2001-2004

	2001	2002	2003	2004
GDP (million JD)	5,704	6,029.7	6,275.4	6,743.8
GDP growth rate (%)	5.3	5.7	4.1	7.5
Population (in million)	4,940	5,070	5,200	5,350
Real per capita (thousand JD)	1.155	1.189	1.207	1.261

Source: *DOS, Annual Report for 2004*

In spite of the many above-mentioned attempts in terms of economic reform and restructuring, the Jordanian economy is still characterised by several persistent features, most notably its high dependency on foreign transfers in the form of workers' remittances and foreign aid and its lack of natural resource. Also, unemployment and poverty remain to severely challenge the economy, and poverty may even worsen in the current economic circumstances. The next section summarises the current characteristics of the Jordan economy, while the subsequent section considers the socio-economic problems challenging the Jordan economy (i.e. unemployment and poverty).

2.5 The main characteristics of the Jordan economy

The Jordan economy's main features are as follows (see Kreishan, 2004):

2.5.1 Small economy: The economy is small in terms of the GDP and per capita, and in terms of population and area. Second, due to its negligible level of international trade (measured by imports and exports), Jordan can be described as a small economy having no effect on prices in international trade (i.e. Jordan is a price taker)

2.5.2 A wealth of human resources: As a result of Jordan's limited natural resources (mainly phosphate and potash), the development of its human resources (i.e. investment in human capital) has been viewed as amongst the main mechanisms which might enhance the competitiveness of the Jordanian economy since independence. Therefore, Jordan has been a trusted supply of trained workforces for neighbouring Arab oil producing countries (see also the following chapter on education in Jordan); therefore workers' remittances comprise a significant source of hard currency. Table 2.2 shows that Jordan benefits markedly from workers' remittances, the net gain workers' remittances (inflows from Jordanians abroad minus outflows from foreign workers in Jordan) is considerably amounting to 1289.5 million JD in 2004 (about 19% relative to GDP)[1]. However, this has in fact contributed to making the economy more vulnerable to external factors. Also, high unemployment hinders the return from human resources in Jordan due to the waste of some of the investment in human capital (see Chapter Four). In addition to workers' remittances, foreign aid and external debt have jointly led the economy to be characterised by its dependency on the external world.

Table 2.2: Workers' remittances inflows and outflows and net gain for Jordan 2000-2004 (Million JD)

	2000	2001	2002	2003	2004
Inflows	1177.3	1283.3	1362.3	1404.5	1459.6
Outflows	123.6	120.8	121.3	141.9	170.1
Net gain*	1053.7	1162.5	1241	1262.6	1289.5

Source: *CBJ, several Annual Reports 2000-2004*
**researcher's calculation*

2.5.3 Large public sector: The state is the main supplier of education, health, and other services including water and electricity. About 50% of the labour force in 2003 was employed in the public sector (DOS, 2003). Therefore, the state is the biggest employer in the country.

2.5.4 The economy's leading sector is services: the services sector contributed around 65.5% of GDP in 2004. Therefore, the economy suffers from structural weaknesses in its productive sectors (i.e. agriculture, manufacturing, construction) which collectively contribute about 35.5% to GDP in 2004.[2]

2.6 Socio-economic problems

2.6.1 Employment and unemployment in Jordan

The labour market is the primary place where people with various levels of education are theorised to acquire the pay-offs of their investment in education and training (see Chapter Four). The major feature of the labour market in Jordan is its high historical incidence of unemployment (see Figure 2.1). This fact may influence students' decisions concerning HE (see Chapter Four). Therefore, it is of particular importance to describe the labour market in Jordan.

The size of the Jordanian labour force has risen substantially, with an annual average growth of 6%, over the period (1990-2003), from 800,000 in 1990 to 1,700,000 in 2003 (http://devdata.worldbank.org, no date, Table 2.2). The services sector is the biggest employer in the Jordanian economy employing around 70% of the total employed, the majority in the public sector. In general the size of the public sector, typically described by economists as non-competitive, impacts on the determination of wage rates in the labour market, where labour unions are also to some degree weak in wage negotiations. The government has persistently, for example, opposed the initiating of labour unions among teachers, who are one of the biggest labour groups.

Monthly starting earnings in the public sector are established based on the Civil Service System (CSS), which identifies the base wage for each education level and specialisation combined with some other complements. There are eight distinct starting earnings groups for HE specialisations (i.e. general medicine, dentistry, engineering, agriculture engineering and geology, nursing, education fields, other university fields and community college degrees)[3]. Chapter Seven is concerned with describing the latter groups' public starting earnings, which are utilised to examine students' starting earnings expectations.

Table 2.3 presents a summary of the average monthly earnings for public and private sector employees by gender in 2003. The table demonstrates that, on average, public employees earn more than their counterparts in the private sector by around 38%. The gender pay gap amounts to about 10% on average, while it reaches nearly 29% in the private sector. Females in the public sector reap considerably higher earnings than their counterparts in the private sector. Based on Table 2.3 and other evidence (see Miles,

2002; World Bank, 2005) the labour market in Jordan tends to suffer from gender-based pay discrimination in favour of males, a characteristic familiar in most labour markets worldwide. A question here arises as to whether students about to make post-secondary education decisions perceive the gender gap prevailing in the labour market. Chapter Seven describes and analyses starting earnings expectations by gender and area and provides an analysis for ERRs as well.

Table 2.3: Average monthly earnings in JD for public and private sectors in Jordan by sex as realised in 2003

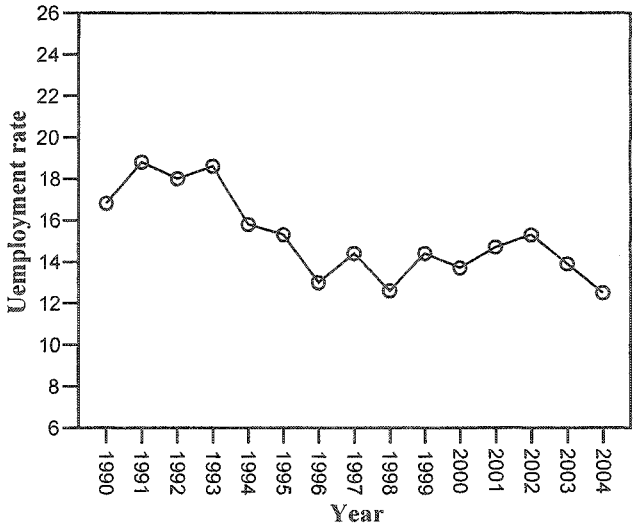
	Mean	Ratio (Male /Female)	Ratio (Public/Private)
Public		107.20%	
Male	297		134.40%
Female	277		161%
Together	291		137.90%
Private		128.50%	
Male	221		
Female	172		
Together	211		
Overall		110.20%	
Male	249		
Female	226		
Together	244		

Source: *Values in this table are measured based on the DOS Annual Report for 2003.*

The labour market in Jordan is associated with high ongoing rates of unemployment, ranging between 20% and 12% during the last 15 years (as shown in Figure 2.1), which have become a prevailing feature of the Jordanian economy since the mid of 1980s after a period with negligible unemployment rates. The Quarterly Labour Force Survey (QLFS) carried out by the DOS in the fourth quarter of 2003 showed that the unemployment rate is 13,9%, 13% and 19,3% for the total workforce, males and females respectively. In general, the survey indicated that unemployment is

concentrated more among the age group of 15-24 years regardless of gender comprising around 50% of the unemployed. A recent, QLFS (fourth quarterly of 2004) reported that the unemployment rate had decreased by more than one percentage point (to 12.5%) in 2004 compared to 2003. These facts may impact on youths' decisions to undertake HE after secondary school, and several studies have examined this possibility (see Chapter Five).

Figure 2.1: Unemployment rate in Jordan for 1990-2004



Source: *DOS, different Annual Reports*

Abdulraheem et al (2004); Al-Etoom (2003) and Altal (1996) identify that the mismatch between education and labour market has contributed to the incidence of unemployment in Jordan. Besides this, the latter two studies emphasize the role of other factors, which jointly led to increased unemployment in Jordan. These can be summarised as follows:

The higher rate of population growth: This has ranged around 3% annually, along with a lower real economic growth rate, which has ranged around 2% from the mid

1980s to the mid 1990s. Also, Jordan is characterized as a young society, with more than 37% of its population in 2002 under 15 years of age, while around 96.5% are under 65 (DOS, 2002). This has serious economic implications regarding education and other social services, especially if these indicators are compared with their counterparts in other developing and OECD countries. For example, the Human Development Report (2002) indicates that 32.7% of the population in developing countries are under 15 years of age, whereas it is 20.4% for OCED countries. On the one hand, 5.1% and 13% respectively of the population are over 65 years old in developing and OCED countries. The higher the percentages of population under 15 years and 24 years old, for example, the higher the pressure on limited public resources available for providing educational services. In effect this could lead to a focus on the quantity dimension at the expense of quality of education. On the other hand, given a particular participation rate of labour and dependency ratio, the higher the percentage of population between the age 15 (the legal age to leave school in many countries) and 65 (the legal age of retirement) the higher demand there may be for employment, which in effect, may lead to higher unemployment rates.

Foreign labour force: The government has estimated that in 2000 there were around 1 million foreign workers from different neighbouring countries, notably Egypt, working in Jordan, legally and illegally and especially in the agriculture and construction sectors. Both sectors involve occupations that are not preferred by jobless Jordanians (The Economist Intelligence Unit, 2001). In this regard, Altal (1996) points to the fact that the vast majority of the foreign labourers occupy jobs which are either characterised by low wages or are socially considered by some of the local labourers as low-level occupations.

The decline in regional demand for Jordanian labour: This can be mainly attributed to two factors: firstly, the low economic growth experienced by Gulf countries in the mid-1980s; and secondly, the wars and regional political instabilities having affected unemployment in Jordan. For example, the second Gulf War in 1990 resulted in a return of 300,000 Jordanian workers, leading to a steep rise in unemployment.

The increase in female labour participation: Estimates of female labour force participation show it to have increased markedly from 17.8% in 1990 to 30.3% 2003, as shown in Table 2.4. Similarly, the percentage of the labour force who are women has risen from 17.1% to 25.5% in the same period respectively. However, when compared with the LMI and MENA groups which Jordan belongs, Jordan lags behind, particularly if one considers the fact that Jordan performs better than these two groups on average in terms of education indicators (see next chapter). The World Bank (2005) suggests that this phenomenon is complex and influenced by many socio-economic factors. One likely variable suggested in the latter study is the pay discrimination that prevails in Jordan's labour market. With respect to unemployment, the latter study found that the probability of a woman to entering the labour market increases more steeply than for males with their level of education attainment.

Table 2.4: Female's Labour force and percentage of labour force for Jordan, Lower-Middle Income countries (LMI) and Middle East and North Africa MENA countries

		1990	2003
Female labour force participation (%)	Jordan	17.8	30.3
	LMI	67.2	67.2
	MENA	26.3	34.5
Female % of labour force	Jordan	17.1	25.5
	LMI	42.2	42.7
	MENA	23.8	29.2

Source: *Data was extracted from Table 2.2, http://devdata.worldbank.org*

Al-Etoom also suggests that other non-economic considerations could have affected unemployment in addition to the points mentioned above. He argues that the social prestige accompanying a HE degree, which can be considered as a consumption motive for HE, and the preference for office jobs rather than vocational work are probably among the prime causes both of higher demand for HE and the existing mismatch between education and the labour market. These suggestions are investigated empirically in Chapter Nine drawing upon a group of scaled statements that tried to proxy for such factors qualitatively.

A related labour market characteristic is the deficiency in the social protection of workers, particularly unemployment compensation. This problem is a general weakness of labour markets in the Arab world, including Jordan (Al-Sana'a & Wadee, 2003). Social protection against unemployment, in addition to its social benefits, could contribute to economic behaviour towards HE enrolment. Compensation for unemployment would lead to a decreased risk of unemployment HE graduates, resulting in the possibility of an increase in demand for HE. On the other hand, it could be argued, given unemployment among secondary school graduates, unemployment compensation raises the opportunity costs of undertaking HE and thus decreases demand for HE. These arguments are based on the tenets of Human Capital theory

(HCT), which considers decisions concerning enrolment as an investment in human capital, and therefore subject to investment appraisal (see Chapter Four).

2.6.2 Poverty in Jordan

Poverty is primarily a humanitarian problem resulting from the interaction between various socio-economic variables and is defined as the inability of individuals to cover their basic needs satisfactorily. Economically speaking, poor people are basically those whose incomes and wealth are below a certain level resulting in threats to their life and ability to work. Typically, economists use the so-called poverty line to identify the minimum amount of income required to satisfy basic needs (Chossudovsky, 1997; Kothari, 1995).

In spite of some recent achievements with regard to restructuring the economy, poverty in Jordan continues to be a chronic socio-economic problem. According to Shaban et al (2001), the fraction of Jordan's population living below the poverty line increased from 3% in 1987 to 11.7% in 1997. The authors, however, reported that poverty tended to have decreased between 1992 and 1997; supporting the idea that education is negatively correlated with the probability of being poor. The latest information on income distribution dates back to the 1997 household survey, which indicated that the poorest 20% of the population received just 7.6% of the total national income. On the other hand, the richest 20% of the population received 44.4% of the national income (CBJ, 2002).

The Jordanian government has initiated many programmes and policies to contribute to the alleviation of poverty. For example, it founded the National Aid Fund to present

cash assistance to poor people. In addition, the government has employed some of the resources from the privatisation of public projects to carry out more infrastructure projects, providing many jobs for poor people. However, according to the CBJ (2004), poverty and unemployment remain the most difficult economic problems challenging the Jordan economy. They require multipronged strategy which, according to CBJ, would involve improving the match between education and the labour market.

2.7 Conclusion

Jordan is a small open developing economy characterised by limited resources and a high vulnerability to external, and especially regional, economic and political shocks. The main natural resources available in Jordan are phosphate and potash. The total area of Jordan is 89.3 thousand km^2, of which around 92% is unsuitable for agriculture. Jordan's population was around 5 millions in 2002, of which 78% lived in urban areas. Jordan has a high growth rate of its population, which has varied in recent years between 2.8% and 3%. This has helped to restrict sustainable economic growth, placing more pressure on public services like education, and is associated with soaring unemployment rates.

Unemployment is especially prevalent among the age group 15-24 years, which may impact on youths' decisions concerning HE. Unemployment and poverty are currently the most difficult problems facing Jordan.

The current economic planning focuses on directing the economy toward the implementation of market-orientated rules where the private sector expected to play the major role in the economy. In this regard, the economy is dominated by a large public

sector employing around a half of the labour force. Jordan has implemented adjustment programmes supported by the IMF aiming mainly to achieve economic self-sufficiency. This unfortunately has not yet developed, and the economy still receives substantial foreign aid.

[1] However, the immigration of educated labour to other countries may result in losing social benefits (i.e. externalities) typically involved in education (see Chapter Four). This issue, which is often called the "brain drain", has been examined intensively in labour and growth economics.

[2] Preliminary values (CBJ, 2004).

[3] In addition to dentistry, the second group includes other specialisations in the area of pharmaceutical sciences.

CHAPTER THREE

EDUCATION IN JORDAN

3.1 Introduction

The development of education, and particularly HE, has received special attention from Jordan's government since independence (Roy & Irelan, 1992). Investment in people is seen as able to grant Jordan comparative advantage, given that the country is endowed with limited natural resources (World Bank, 2005). The prime objectives of modern educational philosophy in Jordan are to improve the quantity, quality and equality of education, and to prepare individuals for work and better citizenship. Most of the plans introduced recently have emphasized education as playing a central role in the enhancement of human resources critical to meeting both the immediate and imminent challenges facing Jordan's development (Ministry of Education (MOE), 2003). As a central part of its extensive and comprehensive economic reform initiative to restructure the economy so as to become a knowledge-based economy, Jordan has focused on investment in human resources, primarily through education. Government expenditure on education represents more than 5% of GDP, a level higher than those in other lower-middle-income (LMI) countries (World Bank, 2005).

In practice, the education system in Jordan has made impressive achievements. The country has consistently emphasized universal education, improving its quality and reducing the illiteracy for people aged 15 and older, to under 10% in 2004 (compared with 60% in the1960s)[1]. In this regard, UNESCO (2006) emphasized that "Literacy skills are very limited in Egypt, Mauritania, Morocco, Sudan and the Yemen, but more

widespread in Bahrain, Jordan, Qatar and the Syrian Arab Republic" (p. 168). The teacher/student ratio has been improved from one teacher per 38 students in 1952 to one per 22 in 2000. The mean number of years in education has increased from 2.33 year per person in 1960 to 6.91 in 2000, the highest in the Arab World (Al-sana'a & Wadee, 2003). Another remarkable development is the percentage of the population with secondary education or higher, which has risen substantially to 35.2 % of the population in 2003, with negligible gender differences (QLFS, Fourth Round/2003). Also, Jordan's HE system has been a trusted source of trained labour in the region over the last four decades (Zughoul, 2000). With respect to gross enrolment ratios, Jordan tends to outperform similar per capita and regional countries, except for pre-basic education (see Table 3.1).

Table 3.1: Gross Enrolment ratio[2] percentage in Jordan, LMI and MENA countries

		1990/1991	2002/2003
Pre-primary (pre-school in Jordan)	Jordan	NA*	31
	LMI	NA	38
	MENA	NA	19
Primary (Basic in Jordan)	Jordan	101	99
	LMI	114	114
	MENA	95	97
Secondary	Jordan	63	87
	LMI	55	74
	MENA	56	65
Higher Education	Jordan	24	31
	LMI	12	21
	MENA	13	NA

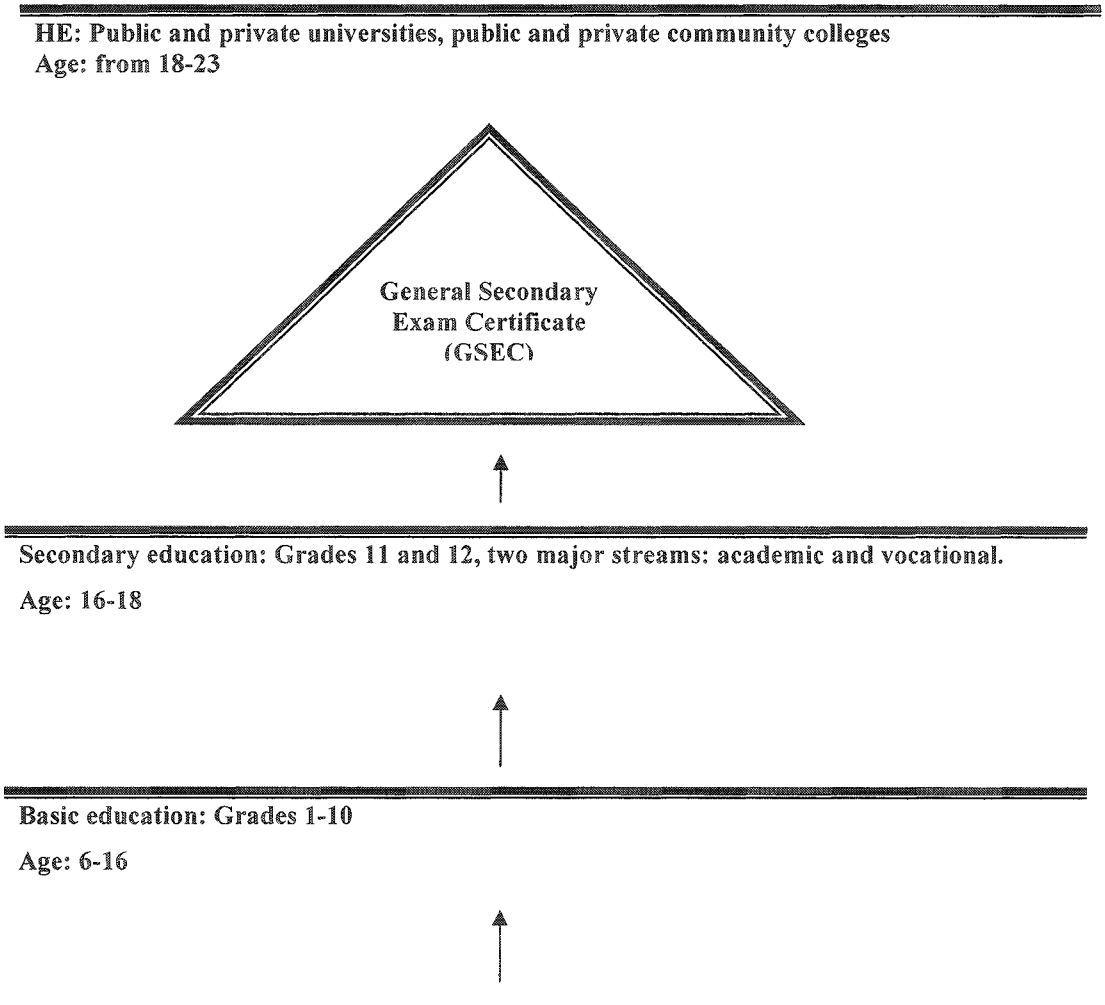
Source: *Data extracted from Table 2.11, http://devdata.worldbank.org.*
* NA=Not Available

The above-mentioned indicators mostly reflect quantitative measures and in reality the labour market is not effectively able to absorb some of those trained because of the mismatch between the skills provided and those demanded by the labour market (Abdulraheem et al, 2004). Recently, it has been argued that the quality of HE might have been negatively influenced by the emergence of private providers, which charge

more and are allowed to admit lower-ability students (Abdulraheem et al, 2004). Also, concerns have been raised, particularly in recent years, regarding the equality of education provision, particularly in HE. In this respect, HE student support is considered to be poor.

This chapter introduces the education system in Jordan (see Figure 3.1), focusing on the transmission process from secondary to HE, student financial support, and a time series analysis of demand for HE over the period 1986-2004.

Figure 3.1: A simple presentation of Jordan Education System



3.2 Pre-HE system

Since independence, pre-higher education in Jordan has witnessed major institutional changes and reforms. The 1950s were marked mainly by the introduction of Education Law No. 20 (1955), which made education compulsory for six years (from ages 6 to 12). During the 1960s, public education continued to expand, especially at the basic level. In addition, rural and nomadic areas started to receive more attention and educational provision from the government. This decade was marked by the introduction of Education Law No.16 (1964), under which many education reforms were implemented. Education became compulsory for all children and adolescents between the ages of six and fifteen (the grades 1-9), vocational education was introduced and secondary education was divided into two distinct streams; academic and vocational. In the 1970s, the system continued to expand in terms of the numbers of students, schools and teachers. In the late 1980s, after the First National Conference for Improving Education held in September/1987 (Roy & Irelan, 1992), the MOE commenced a new era of education reform, which aimed to comprehensively restructure the schooling system. Therefore, a plan for improving school education over two periods, 1989-95 and 1996-2000, was introduced. Public expenditure on school education has in effect increased over the last two decades, amounting to more than 11.5 % of public expenditure in 2003 (Ministry of Finance Monthly Report, December 2005)[3]. With respect to private education expenditure, on average the Jordanian citizen spends around 6.2% of total expenditure on education, as shown in Table 3.2. The table also shows that average percentage spending in AlKarak governorate, in which the fieldwork of this study was conducted, is equal to the national average.

Table 3.2: Percentage annual household member education expenditure by governorate and for the Kingdom in 2003

Governorate	Percentage (relative to total expenditure)
Amman	7
Al-Balqa	6.3
Az Zarqa	4.3
Madaba	6.3
Irbid	5.6
Al-Mafraq	3.9
Jarash	7
Ajlun	5.6
AlKarak	6.2
AlTafiela	4.5
Ma'an	3.1
AlAqaba	4.3
Kingdom	**6.2**

Source: *DOS, Household Expenditures & Income Survey 2002/2003*

However, according to the World Bank (2003), a new wave of reform for the schooling system is required. With the assistance of the WB, the government has prepared for an Education Reform for the Knowledge Economy project, which aims to modernise the educational system, taking into account the needs of a knowledge economy and a lifelong learning society. Under this project, the MOE has decided recently that the English language should be taught during all schooling grades, starting from the first grade until the twelfth. Previously, students in grade 1-4 were not taught English, with attention focused more on studying the Arabic language. Also, the MOE has embarked on a new strategy for equipping schools with IT laboratories and Education (http://www.moe.gov.jo, no date).

Currently in Jordan, as in nearly all Arab countries (Coffman, 1996), the pre-HE system is to a great extent run by a centralised ministry that maintains tight control over all policies relating to education. The system consists structurally of three stages: pre-school education, basic education and secondary education (MOE, 2000). Table 3.3 shows the distribution of pre-HE students in 2003 by stage and supervising authority.

Table 3.3: The distribution of pre-HE students by stage and supervising authority for 2003

	MOE	Others (Governmental)	UNRWA	Private education	Total
Pre-school stage	4797	187	0	92568	97552
Basic education	901983	10563	138026	171828	1222400
Secondary education	153819	10779	617	14585	179800
Total of stages	1060599	21529	138643	278981	1499752

Source: *www.moe.gov.jo and DOS, Annual Report for 2003*

3.2.1 Pre-school stage

The pre-school stage of kindergartens starts at the age of 3 up to 6. The enrolment rate for pre-school education is relatively small, as the vast majority of kindergartens are privately-owned (World Bank, 2003). Around 95% of Jordan's kindergarten students attend private kindergartens (see Table 3.2). Also, the gross enrolment rate, standing at 31% in 2002/2003 (see Table 3.1) is relatively unsatisfactory and is perhaps constrained by income, where the tuition fees for private kindergartens are beyond the financial ability of low–income families. Rural and nomadic areas also generally lack privately-owned kindergartens. This situation has recently prompted the MOE to concentrate more seriously on providing public pre-school and early childhood education, especially in poor, rural and nomadic areas (MOE, 2001). Most of the existing kindergartens are co-educational (i.e. pupils of both sexes attend).

3.2.2 Basic education

Basic education is compulsory and begins at the age of six, which is the official school-entrance age, and lasts for 10 years (grades 1-10). The gross enrolment rate for basic education stood at 99% in 2002/2003 (Table 3.1). It can be seen from Table 3.3 that

basic education included 1,222,400 students in 2003; around 23% of the total population, of whom around 49% were females. Approximately 14% of students in basic education attend private schools. Other providers cater for a considerable number of basic education students, notably the United Nations Relief and Work Agency for Palestine Refugees in the Near East (UNRWA). The main goal of this agency is to provide basic education, relief and training to Palestinian refugees in refugee camps. The UNRWA has introduced basic education for around 11% of the total of basic education students. However, private and non-governmental providers are subject to the regulations of the MOE, particularly regarding the curriculum.

Basic education is free of charge, including textbooks but not other materials, in public schools. However, basic education students pay annual registration fees to help finance some local school services. In this regard, UNESCO (2006) reports that, in spite of the increased recognition of the gains that result from not charging fees at primary level, Jordan is among many countries in the developed world which still impose legal fees at primary level. Students in grades 1-7 each pay JD3 (US$ 4.2) annually, while students in grades 8-10 pay JD4. Nevertheless, student contributions cover less than 2% of the average cost of basic education per student borne by the state (MOE, 2001).

3.2.3 Secondary education

Secondary education is not compulsory, but anyone who succeeds in basic education has the right to enter a stream of secondary schooling, which is divided into the two major streams of academic and vocational education. Gross enrolment rate at the secondary stage stood at 87% in 2002/2003 (Table 3.1). Many secondary schools are comprehensive schools where various fields of academic and vocational education are

taught. Some are specialised in one stream and others provide basic as well as secondary education, especially in low-population areas. This type of schooling is free in public institutions, but students do pay registration fees and bear cost of their textbooks and necessary materials. Table 3.3 shows that in 2003 there were 179,800 secondary students in Jordan, representing around 3.5% of the total population.

The academic and vocational secondary education system involves two grades (11 and 12). Each grade consists of two teaching semesters completed in one year. The academic secondary education incorporates three sub-streams; namely, scientific education, arts education, and information management

A significant proportion of students choose to enrol in scientific education which usually requires a higher average of marks at Grade 10, as it offers its students the right to apply for any course provided within HE. The scientific educational curricula focus principally on subjects such as mathematics, biology, chemistry, physics and English language. Other subjects are provided but are accorded less importance.

Arts education within secondary academic education focuses primarily on arts-based subjects such as Arabic, English and other languages, and historical studies. Science-based topics like chemistry and physics are not provided, except for simple curricula in mathematics and natural sciences.

The information management of secondary academic education branch was introduced in 2003, and focuses mainly on topics related to Information Technology and management. About 5 % of secondary students enrolled in this stream in 2004.

The second major stream is vocational education, which is available for students successfully completing the compulsory stage at grade 10. With regard to vocational college education, the Jordanian education system incorporates the so-called Polytechnics, which present 2-year and 3-year college vocational education to students succeeding in the secondary vocational stream.

3.2.4 The General Secondary Exam Certificate (GSEC) and admission to HE

Jordan's education system emphasises the role of the GSEC in the education process as the only mechanism through which students can go on to HE. The GSEC is arranged by the MOE itself and carried out by education administrations in the governorates. Currently, the results of the GSEC depend on students' results in two general exams held at the end of semesters (one and two). Students that succeed in the GSEC are awarded the secondary certificate (*Tawjihi*), which is broadly similar to the 'A' level in the UK.

Regulations for undergraduate admission to universities and colleges are governed by the HE Law No. 41 of 2001, which assigns the responsibility for identifying admission conditions to the HE council (HEC). Enrolment applications to private universities are administered by the private universities themselves. With respect to public undergraduate HE, The HEC's role involves appointing a central committee charged with judging all applications on an individual basis. This committee is called Admission and Allocation Committee and is usually held in the University of Jordan. Applicants are sorted and distributed to subjects and public universities according to pre-specified criteria. The most important procedures are as follows:

(i) The applicant must have succeeded in the GSEC or the non-Jordanian equivalents such as the British 'A' level. The admission criterion depends on a single method; that is to succeed in secondary education with at least a minimum average marks. The system gives no credits or recognition for knowledge and experience gained in the labour market. Students in possession of average marks over 65% in the GSEC have the right to apply for places at public universities;

(ii) Students are distributed over universities and specializations on a competitive basis both according to their preferences and to their average marks in the GSEC. It is worth noting here that the minimum requirements of the GSEC average do not necessarily guarantee either a place or the desired specialization at a public institution, since the total number of admitted students is constrained by the capacities of the institutions. Thus, the minimum average guaranteeing a place in public HE level varies annually according to the places available, number of applicants, and their achievements in the GSEC.

Despite the fact that the criteria for public university admission are principally competitive, some exceptions do exist and are claimed governmentally to play an important role in promoting equity of educational and economic opportunities for various social groups, and in achieving a diverse student body. Broadly speaking, the most important exception, which is also of interest for the current study, is the quota offered for those obtaining their GSEC at what are called 'disadvantaged schools'. An annual 10% quota of public university admission is reserved for students undertaking

secondary education at schools locating in disadvantaged areas. The HEC set this quota for schools which mostly lie in rural and nomadic areas. This policy, of course, has economic implications in terms of the equity and efficiency of investment in education. If, in reality, academic achievements and the decisions to continue to HE are determined significantly by area of residence, such as in urban areas more than rural and nomadic, then such a policy may be considered reasonable. However, in the public media, and especially in newspapers, some writers refer to this policy as "discriminatory', arguing that such regional differences have disappeared and, in effect, that this policy should be discontinued (Alfanek, 2004). From the policy-making perspective, Ministry of Higher Education (MOHE) points to the realities of discrimination and to its intention to make HE education admission more competitive (http://www.moe.gov.jo, no date).

3.3 HE

In defining tertiary or HE, one may consider the definition agreed by the OECD:

> A level or stage of studies beyond secondary education, undertaken in formal tertiary education institutions but also in a wide variety of other settings, including in secondary schools, at work sites, via free-standing, information-technology-based offering and a host of private and public entities (Whitman, 2003, p. 191).

The Jordanian definition of HE is rather more traditional and general. In the latest relevant statute, the HE Law No. 41 of 2001, HE is defined as any form of education undertaken post-secondary and lasting a minimum period of one year. The roots of Jordanian HE organisation and activities can be tracked back to the 1950s when the government established a few one-year teacher-training institutes, which were then converted into community colleges in 1980. University education started in 1962 with the foundation of the University of Jordan. Many new universities and colleges have been successively established as private and public demand for HE has expanded. The

MOHE was established in 1985 to monitor and direct the HE in Jordan. Since then, public universities and later private universities and community colleges have become the responsibility of the MOHE.

Due to the lack of information in Jordan on other modern types of HE such as distance or electronic education, this section describes the following components of Jordan's HE: public universities, private universities, public community colleges and private community colleges.

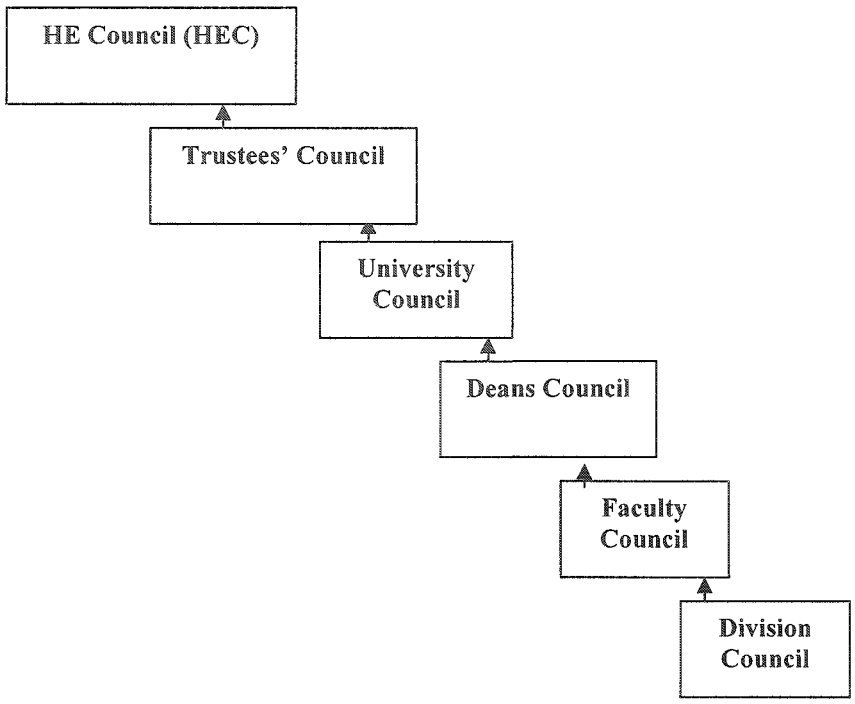
3.3.1 Public universities

After the establishment of the University of Jordan in 1960s, the state has established another eight universities at an accelerating rate: one in the 1970s, two in the 1980s and five since 1994. This trend, which represents an increased public supply of education, can be attributed to the increasing demand for HE and the substantial governmental focus on the development of human resources.

The public universities are distributed over the three regions of the country; in the north, the centre and the south. They hosted 102,404 students in 2002, representing about 71% of the total of university students of 143,511 (MOHE, 2002). The Jordanian HE system could be characterised as decentralised, as every public university has separate legislation defining its aims, internal administration and organisation, wages and salaries system, etc. A general feature of all legislation related to HE is that universities should have a certain autonomy concerning administrative management, teaching and research. However, in relation to laying down tuition fees, structuring study courses and

identifying the maximum capacity of each field or specialisation in HE, the universities and their internal councils are required to prepare proposals and recommend them for agreement by the HE Council (HEC). Figure 3.2 summarises the direction of decision making in relation to tuition fees, study courses and the student capacity of each academic division. Each division's council in a university prepares an annual proposal identifying its maximum capacity for accommodating students to be reviewed by the faculty council and then passed to the HEC for ratification. The faculty councils in association with the division councils prepare lists of courses and their recommended tuition fees. These lists are reviewed by the trustees' council before eventual ratification of HEC.

Figure 3.2: The legal structure of HE councils and responsibility for tuition fees and subject capacities.



Source: *Summarised from HE Law No. 41 of 2001, see pp. 1-5*

3.3.2 Private universities

In 1990, the government permitted the private sector to enter the market in HE and to provide education under certain regulations. Official data indicate that the number of

Jordanians undertaking HE abroad before 1990 represented around 40% of total HE students (see for example, MOHE, 1986; 1987; 1988). The absorptive capacity of public universities was not able to accommodate all the applicants from secondary students. This encouraged the private sector, backed by government policy, to invest in HE provision through private universities, which currently number 15 institutions. The total number of students enrolled in private universities increased from less than 5,000 in 1992 to 41,107 in 2002; or from 10% to 29% of the market respectively. The existence of private universities was the main reason for the lower percentages of Jordanians studying abroad, which fell from over 40% in 1990 to 16% in 2002. However, this percentage is still high, and the number of the Jordanians studying abroad reached 33,329 students in 2002, a figure equivalent to 80% of the number of students in the private universities in Jordan in that year. Most of the subjects provided at the public universities are taught at private universities as well, however, with substantially greater tuition fees. In Appendix 5, some information is shown on the fees charged and subjects taught by both public and private universities.

3.3.3 Public and private community colleges

In 1980 the Jordanian government decided to transform all teacher-training institutes into so-called community colleges, which continued to proliferate, reaching 55 number in the late 1980s. The number of community colleges then fell to 47 in 2002, of which 29 were public, due mainly to the foundation of private universities. Public and private community colleges, which hosted around 29,000 students in 2002, provide two-year and three-year programmes of HE, and award the Intermediate Diploma. To obtain this degree requires students to sit a comprehensive exam, called in Arabic *Alshamel*, held

usually in July every year. Graduates from community colleges can then apply for university education. However, this depends on their average marks in the *Alshamel*, and only a small fraction of such students are usually accepted into public universities. A higher proportion of them may be able to enter private universities, which in general charge higher fees. Usually, a community college student needs between one and two further years to obtain a university degree (i.e. a Bachelor's degree) in an appropriate specialisation (Al-Hasoon, 2000).

3.3.4 Funding HE in Jordan

Generally speaking, there are many different methods used to fund HE activities. Garcia-Penalosa & Walde (2000) and Greenaway & Haynes (2003) highlight some of these methods. Traditionally, HE has been financed from general tax revenue, just like other services subsidized by public sector. Earmarked taxes such as graduate tax, vouchers, differential fees, income contingent loans and pure loan schemes represent common modern financing systems for HE. Some countries use mixed methods in funding HE. The UK, for example, in addition to the public fund from general tax revenue, has applied many methods recently, including differential fees and a system of income-contingent loans. The latter method has also been used in many other countries such as Australia and New Zealand (Barr and Crawford, 1998).

In Jordan, the strategy for funding HE has changed significantly over the last fifteen years, particularly after the implementation of the economic reform programmes (see Chapter Two). The current sources for funding HE are, firstly, public direct and indirect

resources, and secondly, private resources. These are discussed in the following two sub-sections.

3.3.4.1 Public direct and indirect resources

In addition to the direct government subsidy from the public budget, a centrally collected 'universities tax' is imposed on many commercial transactions and municipal services, and then distributed among public universities (Sanyal, 1998). According to Hamad & Al-Basheer (2000), public resources accounted for 42% of the aggregate financial resources of Jordanian public universities in 1991, falling to 36% by 1997. Aleduan (2004) reported that this percentage further declined to 31% in 2003. The strategy of the MOHE for the period 2002-2007 for improving HE consists of several steps, including the following conditions (MOHE, 2002):

1. An increase in tuition fees in public universities and community colleges to help in covering the average costs, of which students pay currently around 25%. This strategy is becoming increasingly common around the world, and is termed cost-sharing strategy (Johnstone, 2004), used as a means to maintain or increase institutional budgets for public universities in the wake of the increased demand for HE.
2. A gradual reduction in governmental support will parallel the increase in tuition fees. As a consequence, the government has initiated a fund for students from poor families. However, the student fund, which is usually justified on equity grounds, is weak in Jordan (see below)

3.3.4.2 Private resources

It is worth briefly describing the credit system in HE institutions before discussing the contribution of students and their families to financing HE. Private and public university and non-university education providers adopt a credit-hour system. Each department in a university or community college has its own plan of field units. Each unit is divided into academic hours, and usually vary between one and three hours. For example, to obtain a first university degree in non-scientific fields such as law, a student needs to complete successfully about 132 academic hours, equal to 44 units. Most of fields require students to spend on average four years in HE to graduate. However, some subjects (especially general medicine) typically take more time than the average. Therefore, the total tuition fees for HE vary according to the number of academic hours required and fees for each individual credit hour as shown in the following formula:

Tuition fees of a specialisation = (credit hours required) X (fee of credit hour)

Contributions by students form the main private resources funding HE in Jordan. These include tuition fees and other lump-sum fees paid by student for various services. Probably, the most outstanding feature with regard to the costs of HE and its financing in Jordan, and perhaps in many countries in the region, is that financial support for students is considered as a social responsibility of the students' families. Therefore, the private costs of HE are principally and primarily paid for the students by parents. Other private sources are rare. For example, part-time employment for HE students, newly graduated from secondary education, is generally difficult to find, (Hamad & Al-Basheer, 2000). Hence, they are principally dependent on their families. The cost of living and transportation related to studies is not the concern of public policy. Hence, there is little information on student expenditure. Some data on the general features of

the HE system, public and private expenditure in HE institutions, and tuition fees are available, but data on other private costs of HE are more difficult to track.

According to Hamad & Al-Basher (2000), tuition fees for students accounted for around 30% of the aggregate institutional budget of public universities in 1997. Recently, Aleduan (2004) showed that student contributions have risen to amount to about 55% (due to the recent HE policy mentioned above). The University of Jordan, is a prime example, with 23,913 students in 2002. It has increased tuition fees for all faculties between 1997-2003. Tuition fees for the faculties of religious studies, law, and social sciences increased by 50% in this period. Other faculties have witnessed the same phenomenon, with fees increasing from 25% to around 75% over the same period (see the Student Guide of the University of Jordan, 1997; 2003).

The MOHE has furthermore allowed the public universities to create another programme for providing HE, called 'the Parallel Programme'. This programme allows students who could not enter the public universities through the competitive process to have another opportunity of entering public HE. Most often, the tuition fees for specialisations provided through this programme have higher tuition fees than for the same specialisation taught in the ordinary programmes. Tuition fees for the 'Parallel programme' actually reach the level of tuition fees requested by private universities.

3.3.5 Public programme of student support in Jordan

The current national student aid can be characterised as poor. In 2004, however, the government recognised this by initiating a new student support fund financed mainly

from the reduced subsides to public universities. Quite simply, the logic underpinning this policy according to the government is that HE support should be mainly directed to students from the poorest family income groups. This newly-introduced student fund is managed by the public universities, and it involves offering both financial support and loans. The eligibility criteria for the fund depend mainly on the level of income of the applicant or his/her family. However, it appears that the amount of money allocated to the fund is insufficient (Alfanek, 2004). In all cases of financial assistance for students, support and loans even for eligible students will cover only a fraction of private education costs (Alfanek, 2004). Therefore, due to the expected insufficiency of resources available for the fund, only those with a very serious economic situation, in terms of family income, may be eligible to benefit.

Broadly speaking, there are also insufficient indirect social concessions for HE students. However, students at public institutions are entitled to some financial support in relation to medical prescriptions, where typically, public universities do support, however slightly and partially, students who have medical problems.

3.4 Demand for HE in Jordan: Recent trends

Analysis of demand at the individual level is a necessity in education planning and policy making (Wetzel et al, 1998). This section highlights the recent trends of demand for HE in Jordan using primarily a time series descriptive analysis. This analysis will show how the demand has increased markedly over the last two decades and contributes to the overall understanding of the student demand for HE in Jordan.

In general, recent trends indicate that Jordan is characterised by high and growing demand for HE. Al-Eselly (2002) and Bani Essa (1995) point out that the period from mid-1980 till the early 2000s experienced increasing demand for HE. The gross enrolment rate to HE in 2003 stood at 31% (see Table 3.1) which is extremely high compared with the rates prevailing in other countries with similar per capita income (LMI group). According to a recent report, (UNESCO Institute for Statistics & OECD, 2005), the annual growth rate of enrolment in HE in Jordan is substantially higher than the overall population growth rate. The report expects that Jordan's education system as a whole is likely to face a considerable additional demand as a result of the demographic characteristics of the population, where the age group below 24 is comparatively high. In terms of the absolute numbers of new students, the demand has increased consistently over the period 1986-2002, except for the community colleges in the mid-1990s. Figures 3.3-3.7 include the most recent available data and show such trends by time series, in different time periods, of the demand for HE in Jordan's universities and colleges in addition to the number of Jordanian students undertaking HE abroad. However, it should be noted here that these figures do not actually reflect exactly the changes of demand for HE overtime. The data presented particularly in Figures 3.3 through 3.6 shows an amalgam of demand and supply of HE in Jordan. The actual number of demanders is probably greater than that indicated in the current section. Nevertheless, these trends remain the best proxy for the actual demand.

Figures 3.3 shows that there has been a considerable expansion in the demand for HE in Jordan as whole, for both private and public institutions. This trend becomes much clearer when one considers the demand for public universities, which typically absorb a large proportion of the demand (see Figure 3.4). A similar trend is shown in Figure 3.5

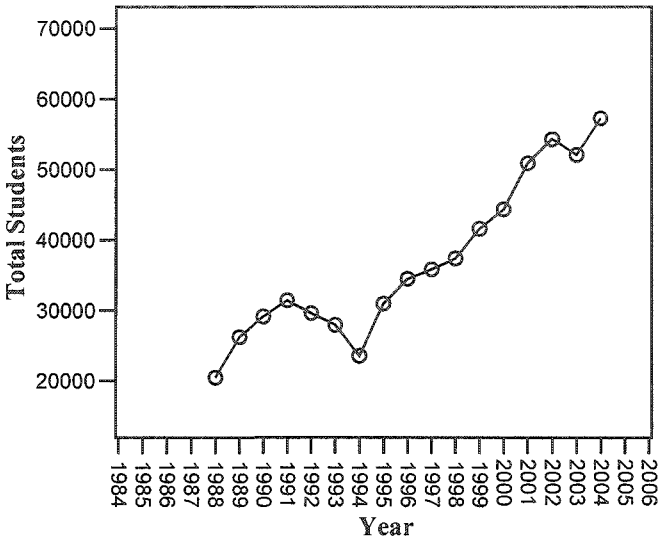
for demand for private university places, specifically until 2002. However, there was a significant drop in 2003, as result of a decrease in demand from overseas students (MOHE, 2003), followed by a slight increase in 2004. One should note that the data shown in Figures 3.3-3.7 include foreign students enrolled in HE in Jordan as new students. Figure 3.8 displays the distribution of new students accepted in the private and public universities in 2003 by nationality, indicating that foreigners represented about 12.5% of the total.

Figure 3.6 indicates that the number of newcomers to community colleges has decreased substantially over the period from the late 1980s until 2003. This can probably be ascribed to the emergence of private universities, which offer university education for students with low average marks. The number of Jordanians enrolling in HE abroad for the period 1996-2002 is also high, as shown in Figure 3.7. As mentioned earlier in this chapter, the total number of Jordanians undertaking HE abroad is equal to about 80% of the capacity of private universities in the country, suggesting that more HE institutions would be required to better accommodate the domestic demand. However, the reasons for the demand for foreign HE by Jordanians are beyond the scope of the current study. Such a topic is worthy of further research. Nevertheless, it is worth mentioning, as shown in Figure 3.7, that in 2003 the number of Jordanian HE students abroad decreased noticeably as a result of the return of the vast majority of those studying in Iraq, after the gulf war of 2003 (MOHE, 2003).

In sum, the demand for HE in Jordan has increased recently and is expected to rise over the next decade. Such increased demand will exert more pressure on public resources. In addition, as mentioned above and in Chapter Three, there exists a mismatch problem

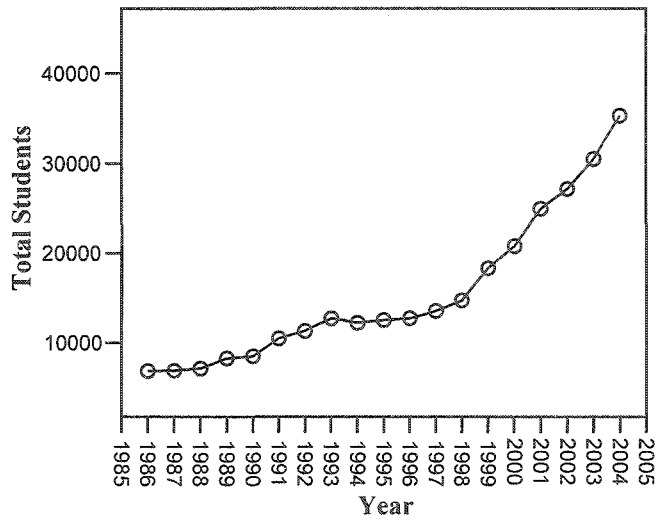
between what is produced in the education system and what is required in the labour market. Therefore, investigating the variables at the student level which influence decisions to participate in HE, is very important cross-sectionally and overtime. This may help in better understanding the individual making decision regarding pursuing HE. A cross-sectional study is conducted in the present research and involves an investigation of whether earnings expectations, measured by ERRs, significantly impact upon demand for HE. A further objective is to examine first whether or not students base their earnings expectation on the current structure and levels of earnings, and second whether students' earnings expectations match with actual reward for HE (see chapters one and six). The concurrent investigation of these objectives will show variables in the demand. It will shed light on to what extent rates of return (RORs) measured using cross-sectional realised earnings can be a powerful policy tool to anticipate future student demand. Also, examining ERRs and earnings expectations will suggest on to what extent the students are well-informed about HE and labour market opportunities.

Figure 3.3: Total demand for HE (fresh students in public and private universities and community colleges) in Jordai for 1988-2004



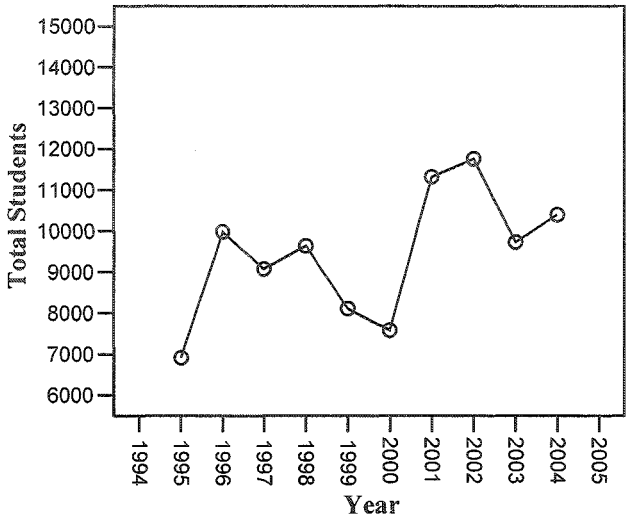
Source: *MOHE, Annual Statistical Reports, different years*

Figure 3.4: Demand for public university (fresh students) in Jordan for 1986-2004



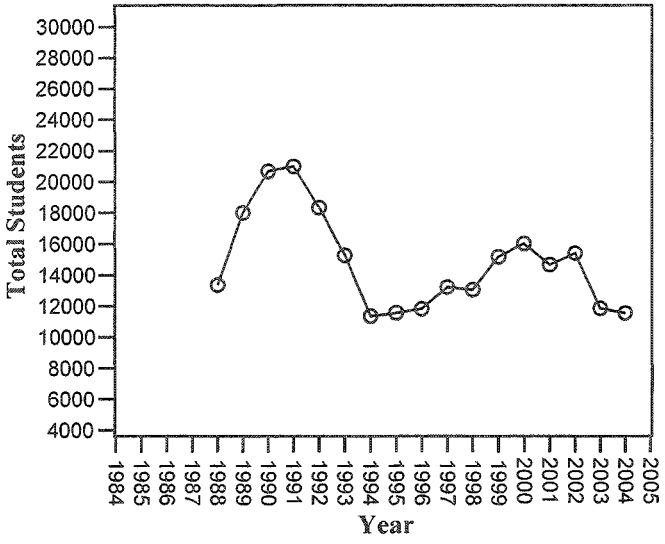
Source: MOHE, *Annual Statistical Reports, different years.*

Figure 3.5: Demand for private university (fresh students) in Jordan for 1995-2004



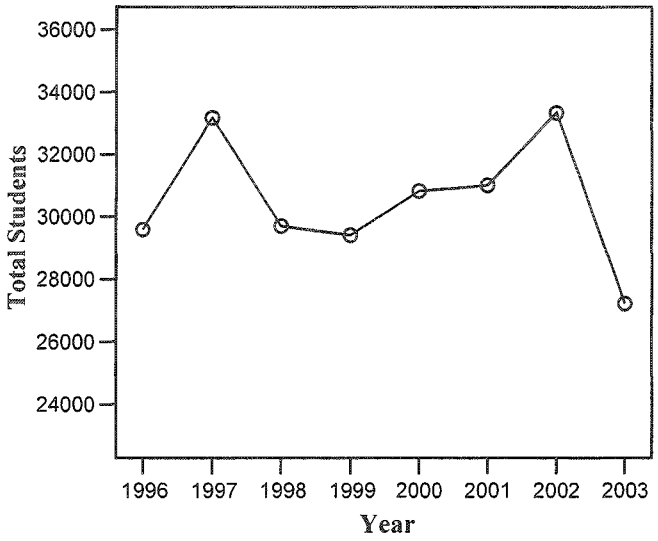
Source: MOHE, *Annual Statistical Reports, different years.*

Figure 3.6: Demand for community college education (fresh students) in Jordan for 1988-2004



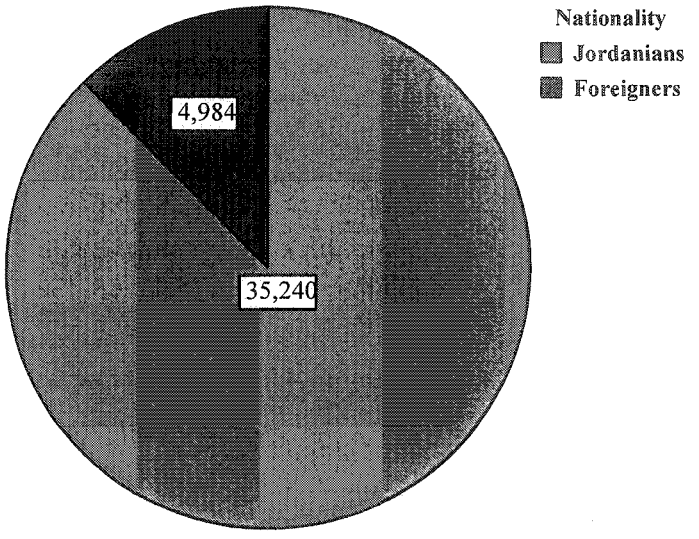
Source MOHE, *Annual Statistical Reports, different years.*

Figure 3.7: Demand for international HE (Total of Jordanian students abroad) for 1996-2003.



Source: MOHE, *Statistics of Jordanian Students at the Institutions of HE Abroad, 2002/2003.*

Figure 3.8: Demand for university education (fresh students in private and public institutions) in Jordan by nationality in 2003



Source: MOHE, *Annual Statistical Report, 2002/2003.*

3.5 Conclusion

This chapter has introduced the Jordanian education system, which was divided into two main stages; pre-HE and HE. Despite some imperative achievements for the system internally and regionally, it faces various current and future challenges given the importance of human resources compared to the severely limited natural ones and the emergence of the knowledge and technology-based global economy. Broadly speaking, as the country is characterised with high growth rate and high percentage of those aged under 24-year old, the system is expected to encounter more pressure on education services. With respect to demand for HE, the available data indicates that the country has witnessed a remarkable rise. Other data sources show that the demand is likely to continue to increase in the next decade. However, the current available data do not indicate the distribution of HE enrolment among various socio-economic backgrounds. In a related vein, the current student support programme is weak despite the newly introduced student fund. It appears that the amount of money allocated to the fund is insufficient (Alfanek, 2004). In all cases of financial assistance for students, support and loans even for eligible students will cover only a fraction of private education costs (Alfanek, 2004). The eligibility criteria for the fund depend mainly on the level of income of the applicant or his/her family.

[1] For the whole world, the literacy rate increased to 80% in 2000 compared to 63% as recently as 1970 (Todaro & Smith, 2003).

[2] Gross enrolment ratio is the ratio of total enrolment, regardless of age, to the population of the age group that officially corresponds to the level of education shown (http://devdata.worldbank.org, Table 2.11).

[3] Preliminary values.

CHAPTER FOUR
DEMAND FOR HE: ECONOMIC INTERPRETATION

4.1 Introduction

This chapter provides an overview of the theoretical economic interpretation of student demand for HE, focusing primarily on Human Capital Theory (HCT). The explanations of HCT of the role of education are the most widely empirically supported at the societal and individual levels. The chapter, however, will throw light on the Signalling-Screening Hypothesis (SSH), which is the main rival of HCT. Regarding demand for HE, as will be elaborated below, these two theories do not conflict much on the link between education and earnings, and in turn on the investment element involved in education, at least at the individual level. However, there is disagreement over the mechanism through which education positively influences earnings.

The main method that has been applied to examine the fundamental influence running from education to earnings is to estimate/measure rates of return (RORs) to education using different methods. RORs serve economists and policy makers in different fields; and therefore have been regularly and intensively measured. Regarding demand for HE, RORs serve economists in explaining the past and current situations, and in anticipating the future patterns of student demand. Conceptually, the design of measurement/estimation method of RORs has been based on HCT, which considers demand for education as an investment decision not only at the individual level but at the social level as well. However, econometric innovations added to the methods of estimation of RORs have tended to be stimulated by the need to hold constant the influence of innate ability on earnings, which represents the central argument of SSH.

The theoretical differences between HCT and SSH are explained in the next section, and the following sections explore different topics which however, are interrelated as they all relate to the measurement of RORs. Section 4.3 contains various sub-sections concerned with the benefits and costs of education and the conventional methods used to compute/estimate RORs.

Although the current thesis is more concerned with the empirical evidence of expected rates of return (ERRs) to HE (see the next chapter), it is of great importance for comparison purposes to highlight the empirical evidence on RORs to education. This is summarised (in section 4.5). But due to the fact that the available literature of RORs includes literally hundreds of studies, if not thousands (Trostel, 2005 and Wiess, 1995), the aim is merely to present a brief summary of international trends drawing on the most recent reviews. Section 4.5 also examines studies on RORs in Jordan as well.

4.2 Human capital theory (HCT) and the signalling-screening hypothesis (SSH)

Although some of the classical economists, as early as Adam Smith, paid attention to the importance of human skills to the economy[1], the concept of human capital, and in effect HCT, was not fully developed and articulated until the early 1960s (starting with Schultz, 1961). According to Blaug (1976), the era before the foundation of HCT was dominated by the view that private expenditure on education was mainly for consumption motives. On the other hand, the main concept of HCT is to emphasize the centrality of the investment element of demand for HE, a notion that is accepted in the SSH (see below). HCT stipulates that education is an economic investment equally for the individual and the society, proposing that education increases productivity per se and in effect for the whole economy in terms of aggregate output. In fact, one of the

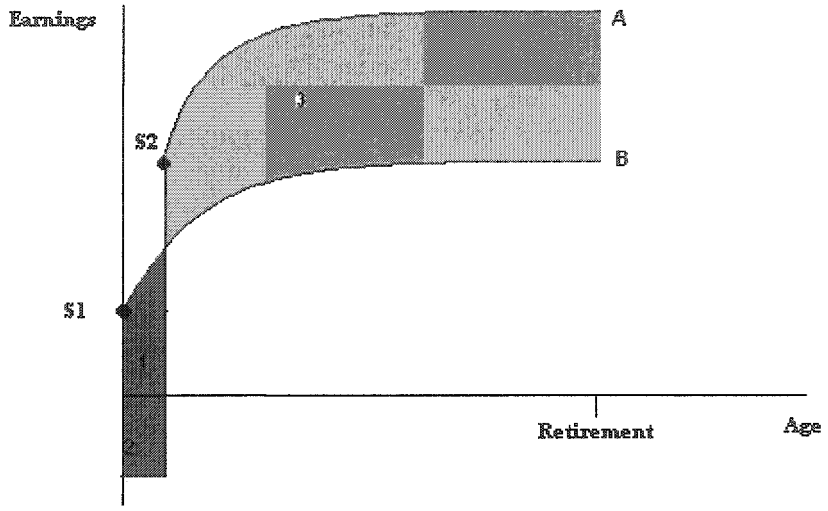
reasons behind the development of human capital theory is the examination by economists through 1950s and 1960s of the roots of economic growth. Empirical studies in that era found that the conventional factors of economic growth did not give a full explanation of its trends. Schultz (1961) strongly stressed that economists should take into account the critical role of human capital investment in explaining the unexplained residuals in economic growth regression equations. In this light, he argued that investment in human capital should be viewed in the same way as for physical capital. In other words, not only the amount of work done, but the qualities of human beings, which include the knowledge, skills, and competences embodied in individuals, which can all be augmented by education, should be included in the economic interpretation of economic growth[2]. The concern about the role of human capital in economic growth has run in parallel with a considerable focus also on microeconomic decisions about human capital investment in education, health, training (general and specific training), migration, and individual and social decisions on lifelong learning.

Becker (1964, 1975, 1993) provides the theoretical microeconomic basis of the HCT. According to him, with respect to microeconomic decisions on education, an individual as a self- interested- utility- maximising agent will deal with education like any other investment decisions (i.e. human capital investment). Becker defines human capital investment as "activities that influence future monetary and psychic income by increasing the *resources in people*" (Becker, 1993). The simple model of HCT therefore emphasizes the economic outcome of education for both the individuals and the society through the mechanism of enhancing individual productivity, or *resources in people*, as referred to by Becker. Accordingly, the private or student demand for HE exists, in the view of HCT, mainly for investment purposes. Students are theorised by HCT as

economic actors who make their decisions on demanding (HE) based on rationally weighing up the benefits of participation in HE, in terms primarily of *earnings differentials*, against the costs of participation, including the cost of earnings foregone by remaining in HE. Practically, higher lifetime earnings for those with more education (e.g. HE) over the less educated (e.g. secondary education) are used to extract RORs and typically extracted from the difference between age-earnings profiles for various levels of education (see section 4.3 below).

Figure 4.1 portrays the simple model of HCT of investment in HE. In this model, A represents the earnings profile of those employed with HE, while B is the earnings profile of those employed with secondary education only. Area 3, the incremental earnings, shows the undiscounted lifetime monetary benefits of undertaking HE. According to the HCT model, this area should be contrasted with the total of areas 1 (indirect costs of education, represented by the foregone earnings) and area 2 (direct costs of education such as tuition fees). More formally, the condition for continuing into HE is that the discounted value of benefits (net present value) of investment in HE should exceed that of costs of undertaking HE. RORs methods, discussed in 4.3.4 below, can be used to calculate the profitability of investment in education. For example internal rate of return method discounts the future values of benefits and costs of education and measures RORs, which can in turn be compared with other available investments. HE investment is worthwhile if it maximizes the net present value of earnings differentials, compared primarily with secondary education and other types of investment. In other words, RORs should be positive and higher than any other rates of return generated from other investments.

Figure 4.1: HCT model of investment in HE

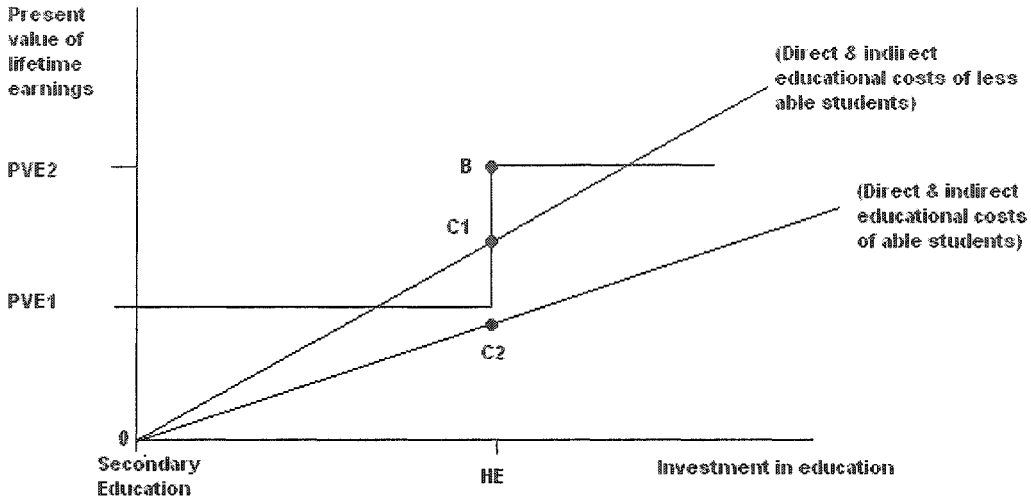


A= Age-earnings profile for HE
B= Age-earnings profile for secondary education
1= The indirect costs (foregone earnings)
2= The direct costs of education (e.g. tuition fees)
3= The undiscounted benefits of education (represented by earnings differentials)
S1= Starting earnings for secondary education.
S2= Starting earnings for HE.

As opposed to the HCT explanation that more education enhances productivity and, in effect, earnings, the SSH, which was largely developed by Arrow (1973) and Spence (1973), argues that education functions as a signal of and screen for unobserved productivity; and is therefore sometimes referred to in the literature as the sorting models (Weiss, 1995). According to this approach, individuals invest in education to signal their native productivity to employers. On the other hand, employers utilise education as an information device to sort employees into ability groups. Economists distinguish between what are called the strong and weak versions of SSH. The strong version argues that education is used exclusively for sorting purposes, whereas the weak version accepts the productivity-enhancing effect of education proposed by HCT besides its sorting role (Psacharopoulos, 1979).

According to the contentions of SSH, area 3 in Figure 4.1 is at least partially caused by innate ability of highly educated. This is because education is not only exogenous determinant of earnings, but also it is endogenous to innate ability. Simply speaking, the earnings benefits resulted from HE implied an important role of innate ability, which is according to SSH positively linked with the probability of a student undertaking HE. In the simple model of SSH, the level of innate ability determines the way able and less able students self-select into educated and uneducated groups. A critically determining assumption of the SSH model here is that educational costs of investment in education are *negatively* influenced by innate ability (Ehrenberg and Smith, 1997). Less-ability students group is more likely to need more time to continue education, assumingly. This will result in increasing the opportunity costs of conducting education or ability signalling (forgone earnings). Educational direct costs (e.g. tuition fees) become greater for less able students as they spend more time in education. Alternatively, less able students may require longer hours to understand topics involved in HE, meaning greater opportunity costs than borne by abler students. This simple model of SSH of investment in HE is depicted graphically in Figure 4.2. A student from less ability group is theorised, given the assumption that education costs are negatively linked to ability or productivity, not to go on to HE and enter labour market after the secondary school. This is because choosing secondary education results in maximising his/her present value of lifetime gain from employment with education. In case of selecting HE, a less able student would gain only the difference between the present values of lifetime earnings and educational costs (B-C1), which is lower than the gain resulted from employment with secondary education (PVE1-0). On the other hand, abler students will choose HE, which maximises their lifetime gain. This is clear from the comparison between the amounts (PVE1-0) and (B-C2), where the latter is greater than the former.

Figure 4.2 SSH model of investment in HE



The process of signalling through education, according to SSH, will enable employers to set two *separating equilibria* in which highly educated (and abler) workers are offered higher wages than what is paid for less able. On the other hand, abler employees will invest in education to signal their ability to enable employers to distinguish them from their less able counterparts; otherwise the employers will not be able to screen productivity and offer equal earnings for all employees (*pooling equilibrium*).

Empirically, studies of demand for HE/HE enrolment decisions (for empirical literature see next chapter) normally control for ability. It seems that most studies unreservedly hypothesise that ability influences the demand positively. However, much stronger debate exists on the definition of ability and what is the best measure to reflect it. Regarding this, Clark et al (2005) point out that:

> Intuitively one would expect that an individual's ability would determine to some extent whether he or she stays on in education after age 16. However, testing that is not straightforward. There are many relevant dimensions to ability and whatever measure is considered it will reflect both individual inherent attributes and also the outcome of earlier educational experience (p. 75).

It is worth noting here that most of the available empirical work has favoured HCT theory. Little or no support has been found for the strong version of the SSH, while many studies have documented some support for the weak version (see Weiss, 1995). Wiess (1995) recommends looking at SSH as an extension of the HCT, implying that both approaches consider the individual demand for education as a rational decision taken by students, who weigh up the return form education against its costs. In this regard he points out that:

> In both approaches, profit-maximising firms compete for utility-maximising workers, and the expected lifetime compensation of a worker with a given set of observed characteristics is equal to the expected lifetime productivity of a randomly selected worker with those characteristics. Both human capital and sorting models assume that individuals choose a length of schooling that equates their marginal return from schooling to their costs of schooling. The models differ in that sorting models allow for attributes that are not observed by the firm to be correlated with schooling (p.136).

4.2.1 Empirical approaches of examining SSH against HCT

Some studies have tried empirically to evaluate the signalling and screening role conveyed by education by running earnings functions for self-employed workers against those employed (Riley, 1979; Wolpin, 1977; and, more recently Heywood & Wei, 2004). Based on the contentions of the SSH, self-employed need not signal their ability and therefore are expected to obtain returns to education that are less than those experienced by other workers. The earnings of the self-employed therefore should more nearly reflect the actual productivity-enhancing role exerted by education on earnings

(this may be examined by comparing the rate of return for a cohort of self-employed workers with different education years/levels). The few studies that have applied this approach have documented some influence for the signalling-screening component of education, however supporting the weak version of the latter theory. For example, Heywood & Wei (2004), who termed the self-employed as presumably not-screened as opposed to the screened employed, provided strong evidence on the existence of the effect of screening on wages. However, the study concluded that education was proved significantly to augment human capital and in effect earnings rates.

A widely used empirical approach to examine the validity of HCT is to test for the existence of sheepskin effects in returns to education (an earlier famous work is Hungerford & Solon, 1987; for more recent studies see Pons & Blanco, 2005, and Trostel & Walker, 2004). The sheepskin argument is based on the notion that wage rates increase disproportionately with the years of education, conveying a credit for completion of a degree as opposed to a non-completion. For example, workers with four-year undergraduate degrees may earn more on average per year than others who have undertaken the same education but dropped out before gaining completion certificates. The existence of sheepskin effect means that certificates accredit higher innate ability besides the potential direct productive effects.

Some recent empirical work has provided evidence on sheepskin. For example, while Trostel & Walker (2004) found sheepskin effects to exist in USA, Trostel & Walker (2005) largely denied that such effects existed in the Spanish labour market. Overall, Gullason (1999) provides a wider discussion on the sheepskin literature and concludes

that the vast majority of studies of sheepskin effects are supportive of the human capital argument.

Despite the huge literature of testing SSH and determining its influence on RORs, it is worth mentioning here that in general there has been a fundamental difficulty in distinguishing between the extent to which education is a signal of native productivity as opposed to enhancing productivity. This is, of course, because both explanations imply a positive causal connection between education and earnings (Chevalier et al, 2004). Johnes (1998) refers to this phenomenon and offers two reasons: (1) there has been no clear definition of a sorting hypothesis, which means different things to different economists; and (2) it is impossible to have a clear-cut test of sorting, as stated by Lazear (1977) in an early review. Bearing this in mind and that both theories agree that education is an investment at least for individuals, it tends to be rather difficult to test the existence of signalling-screening effects using starting earnings, or expected starting earnings, as are used in the current study.

4.3 Benefits and costs of education and rate of return estimation/calculation

Dominated by the views of HCT, economists believe investment in education to be beneficial not only at the individual level but also at the social level, thus requiring government intervention. The theoretical justification for the public funding of education is based on the argument that education bears some public good characteristics, as it results in positive externalities to the whole society. The argument that education yields a variety of external benefits suggests that individuals will under-invest in education from a social perspective. Governments therefore need to intervene in the education market to prevent private market failure (Carven et al, 1987).

Intervention in turn involves devoting some public resources towards education provision, and consequently requires submitting investment in education to economic appraisal using rate of return analysis, which has been the most widely used method (Hough, 1996; Weale, 1993). It can be used to allocate public resources among various educational needs, and by measuring RORs, economists can make comparisons among various investments in human and fiscal capitals. Furthermore, measuring RORs may assist in explaining past and current demand for education, and, in effect, forecasting future demand.

Often, economists distinguish between two types of ROR to education; private rate of return and social rate of return, which are typically measured as averages (i.e. per year) to reflect the marginal increase in return, and per educational level. The former is defined to reflect the rate of return gained by the individuals involved in investment in education. On the other hand, the social rate is measured to show how much society gains from public expenditure on education.

The rate of return calculation is theoretically assumed to enumerate all relevant benefits and costs of education regardless of the time over which they occur. However, in practice this is constrained by the availability of data and awareness of all possible types of benefits. Monetary outcomes, such as earnings, are usually much easier to evaluate individually and socially. Thus, the vast majority of studies measuring ROR have focused on the monetary outcomes of education using the well-known Mincerian method. Before explaining the methods of estimating and measuring rate of return, it is important to briefly look into various costs and benefits involved in social and private investment in education.

4.3.1 Public and private costs of education

Society is responsible for bearing a segment, usually a significant one, of education expenses, including such explicit costs of organising education as the fixed costs and infrastructure costs of educational projects, maintenance costs, and the salaries and wages of teaching staff.

Private costs, on the other hand, are very important especially in the case of HE where students typically fund a significant part of the expenses. Broadly, private costs consist of two types; direct and indirect costs. Tuition fees comprise the main source of the direct educational costs borne by students. Other direct costs are important but often difficult or costly to track (e.g. textbooks, transport, and accommodation).

In contrast, the indirect costs of education are typically represented by foregone earnings, which represent the opportunity costs of remaining in education. They are of great importance, at least abstractly. Students will lose the opportunity to a acquire earnings through labour market jobs while remaining at school or in HE. Labour market conditions affect the size and existence of the indirect costs of education. If, for instance, the unemployment rate is high among those with secondary education, the foregone earnings would be negligible and therefore may not inversely influence the decision to continue into HE. The situation would be different in other cases where students are enrolled in part-time education while they work.

However, as mentioned above, in some cases it hard to track or estimate some of the private and social costs, as well as some benefits, leading to either upwards or downwards bias in the RORs measured.

4.3.2 Private benefits of education

The private benefits of education and HE are those benefits absorbed by individuals undertaking education. Broadly speaking, the private benefits of education can be divided into two types: monetary or market benefits and non-monetary or non-market benefits (McMahon, 1998). These are discussed in the following two sub-sections.

4.3.2.1 Private monetary benefits of education

Private monetary benefits of education consist mainly, and empirically, of higher lifetime earnings for those who are better educated. HCT emphasises the direct relationship between education and productivity. In turn, according to the neoclassical theory of labour market, productivity determines wage rates in market. Also, as shown above, SSH accepts the positive relationship between education and earnings, although this is though to be due to information imperfect in the labour market. However, the link between productivity/education and earnings might not necessarily be reflected properly in the labour market. Payments may be influenced by the flexibility and competitiveness of the labour market. For example, a highly unionised or regulated labour market implies less individual variation in earnings (Heywood & Wei, 2004), especially at the entry level.

Higher lifetime earnings for those with more education (e.g. HE) over the less educated (e.g. secondary education) are typically extracted from the difference between age-earnings profiles for various levels of education. Economists have observed that age-earnings profiles, particularly in the developed economies, take roughly a concave shape over the working life (Johnes, 1993; Polachek & Siebert, 1993). In the early periods of a worker's employment, earnings increase gradually, then slow down around

mid-life and then decline as retirement approaches, following a concave path overall. According to Polachek & Siebert (1993), this phenomenon may be attributed to the central tenet of HCT that education is an investment. An individual invests more heavily in education and other types of human capital investment over his/her youth, given that he/she will have a longer working life to reap the gains. In effect, earnings rise over the early years of working life. Generally speaking, as people get older, their incentives to invest in education and training are expected to decrease. It is worth noting here that even the strong version of the SSH accepts that age-earnings profiles for the more educated lie above those of the less educated. However, it argues, unlike in HCT and the weak version of SSH, that age-earnings profiles of those having the same level of ability, or native productivity, regardless of their education will converge as soon as the ability sorting process is complete (Psacharopoulos, 1979). In his seminal work, Psacharopoulos (1979) implies that HCT and SSH do not conflict over the fact that higher educated people are paid more than their less educated counterparts at the entry level (i.e. starting earnings). The question arises here about the extent to which students about to make their decisions on pursuing HE or entering the labour market are aware of such a case. In the present thesis as mentioned elsewhere, starting earnings expectations are used to detect whether students perceive the link between education and earnings, and whether their starting earning expectations influence their demand for HE.

4.3.2.2 Private non-monetary benefits of education

Although most research on the benefits of education has tended to concentrate on market outcomes, and particularly labour market return, the benefits of investment in education and HE are not limited to labour market rewards, since education influences many non-market or non-monetary activities, such as home-production efficiency and

consumption benefits (Wolfe, 1995). Consumption benefits are, according to the classical view of education, the main determinant of student demand for education (Blaug, 1976). Consumption benefits such as satisfaction and the pleasure experienced by a student throughout their education and subsequent life (e.g. socialising with others while in HE), may exert a positive impact on student behaviour towards HE. Consequently, any omission of such consumption elements, if they are present, would underestimate the actual value of ROR (McMahon, 1987). Also, the presence of consumption motives as driving forces in the demand for education requires policy-makers to be aware of their potential impact on current and future demand. However, it is rather difficult to obtain data on such benefits for large samples typically used in measuring RORs.

Despite the extensive theoretical work concerning the existence of the non-monetary benefits of education (for the individual's concerned and externally the society), the empirical literature on such phenomena and their magnitude is comparatively limited. Table 4.1 summarises some of the potential hypothesised/found benefits of education. Of course, the monetary benefits (higher lifetime earnings) are the easiest to measure, and therefore have been intensively used in the measurement of RORs.

Table 4.1: Potential private and public benefits of education[3]

Private benefits	Public benefits (externalities)
1. Higher individual market productivity leads to higher earnings over working life.	1. Productive individuals enhance economic growth and overall competitiveness.
2. The wife's education might affect the husband's earnings; the parent's education might affect children's education, future earnings, health and fertility.	2. Education creates new knowledge and raises the stock of educated people through universities, leading to improving the societal ability for the diffusion and adoption of technology.
3. Education improves one's own and the spouse's health.	3. Education is a policy tool to enhance social cohesion and combat social exclusion and poverty.
4. It increases one's efficiency in: home-production activities; consumption activities; job searching; marital choice; attainment of desired family size; savings activities.	4. For democratic change; educated people are more likely to be politically active, and knowledgeable about government activities.
5. The better educated are more likely to acquire better working conditions and prestige, longer job tenure, more on-the-job-training opportunities, and are less likely to be unemployed.	5. Education leads to reduced crime rates.
	6. It results in more resources through more income tax revenue.
	7. The better educated are less reliant on income transfers, are more charitable and more likely to engage in voluntary activities.
	8. Peer effects during work include that one's productivity positively affects others' productivity in firms.

4.3.3 Public benefits of education

The public benefits of education (see Table 4.1) are those benefits absorbed by other members of the society. These are sometimes described as 'spill-over' benefits or positive externalities and are of great relevance to public policy on education and HE, and justify government intervention in education. In practice, some of the public benefits of education, or more precisely monetary public benefits, are included in the formula for calculating social ROR in order to identify the extent and desirability of public expenditure on education and HE. It is widely known that public benefits as represented by externalities are more difficult to identify and measure. Typically, therefore, social RORs are viewed to be more difficult to calculate than their private counterparts (Ashworth, 1998). Sianesi & Reen (2003) and Venniker (2001) provide reviews of the recent literature on human capital externalities, concluding that the

existing empirical research is scarce and ambiguous in supporting human capital externalities.

4.3.4 Rate of return to education methods

There are traditionally three main methods applied to calculate RORs. These are the elaborate method of the internal rate of return to education, the short-cut method and the earnings function, or Mincerian method (Psacharopoulos, 1995). In spite of its theoretical desirability, the first is rarely used compared to the third, which is the most widely used due to the availability of microdata and its ease of estimation (Harmon et al, 2003). The short-cut method has been applied in some studies, particularly using subjective earnings expectations (see the following chapter). In the following sub-sections, all of the above-mentioned methods will be discussed in turn. It is, however, worth mentioning here that, since its origination, the Mincerian method has been a subject of enormous debate concerning potential bias in its RORs. Hence, economists have developed many econometric innovations to detect/adjust bias in the RORs measured utilising this method (see Card, 1999). In this chapter, the aim, however, is largely to present the traditional type of Mincerian method, throwing some light on its disadvantages and the main sources of bias (ability bias). In addition, examples of how economists have tried empirically to alleviate such bias will be briefly shown.

4.3.4.1 The elaborate method (internal rate of return)

Equation 4.1 provides the general formula of the internal rate of return. An additional investment in education is E, which is undertaken after the education level S and lasts for m period of time, the net benefits of investment E are B_E-B_s, which are in practice the earnings differential. n denotes the retirement age, while C represents the direct cost

of conducting E. The inclusion of B_S in the right side of the equation represents the indirect cost, foregone earnings, of education E. Usually, economists utilise the number of years spent by a worker with E level of education in the labour market up until retirement. Having obtained data about the various relevant variables, the aim will then be to calculate the value of r that satisfies the equation. In other words, the aim is to find r that equates the values of the benefits and costs of education investment (e.g. university education).

$$\sum_{t=1}^{n+1}(B_E - B_S)_t /(1+r)^t = \sum_{t=1}^{m+1} (B_S + C_t)/(1+r)^t \qquad \text{Equation (4.1)}$$

Private and social RORs can both be measured utilising this method. Ideally, the private rate of return for this method, as for all other methods, should include merely the private benefits of education, primarily work-life-tax-discounted earnings, and private costs. On the other hand, the social rate of return in practice includes the social benefits of education, primarily before-tax earnings. In addition to private costs, the social rate of return should include the social costs of the education investment under assessment. In practice, externalities and non-monetary benefits of education are usually neglected, as they are difficult to value (Cohn & Addison, 1998).

In the case of university education, as an example of demand for education and investment in human capital, the internal rate of return formula is shown in Equation 4.2. The duration of working life lasts for about 43 years, as the period spent in HE is assumed to be 4 years (from ages 18 until 22), and retirement age is assumed to be 65. The subscripts s, u denote secondary education, which represents the control group in practice, and university education, respectively.

$$\sum_{t=1}^{44}(B_u - B_s)_t /(1+r)^t = \sum_{t=1}^{5}(C_u + B_s)/(1+r)^t \qquad \text{Equation (4.2)}$$

In addition to the difficulty involved in securing the data to run it, the elaborate method is not an econometric estimation method, meaning that one cannot control for other variables that might influence earnings other than investment in education. Such a control, however, may be carried out using the earning function (Mincerian method) and its related recent econometric innovations.

4.3.4.2 The short-cut method

This method is simpler than the previous procedure of calculating social and private RORs, (Cohn & Addison, 1998; Psacharopoulos 1995). It gives an approximate estimation of returns relying on the conversion of the formula for returns into a simple linear function, as follows in Equation 4.3:

$$\frac{\overline{W_E} - \overline{W_S}}{n.\overline{W_S}} = r \qquad \text{Equation 4.3}$$

where $\overline{W_E}, \overline{W_S}$ represent the mean earnings of an individual with education E and S respectively, and n denotes the number of years spent in the education level of E, which is 4 years in the case of university education. This method is typically most beneficial when cross-sectional actual earnings data are unavailable, but where mean earnings by level of education are available (Cohn & Addison, 1998).

The short-cut method has been utilised to calculate ERRs drawing on starting earnings expectations. Thus it is discussed in more details in the next chapter, which considers the literature on earnings expectations and demand for HE.

4.3.4.3 Earnings function method (Mincerian method)

Mincer (1974) set the traditional framework of applying earnings equations in estimating returns to education by means of semi-log functions. As pointed out by Cohn & Addison (1998), this method is the most widespread tool applied in empirical studies of the RORs. Basically, this method relies on the assumption of human capital theory of a positive direct relationship between education and productivity, and, in effect earnings. Thus, one can determine that fraction of earnings caused by level of education/years of education through basically estimating the relationship between earnings as a dependent variable and education as an independent variable, controlling for other factors. Much of the recent applied work has focused on estimating a version of the following earnings function:

$$\ln Y = \alpha + bS + cEXP + dEXP^2 + Z + \varepsilon \qquad \text{Equation 4.4}$$

Where S denotes years of schooling, $\ln Y$ stands for the natural logarithm of earnings, EXP is the experience of labour and could be represented in practice by years spent in the labour market, EXP^2 a quadratic term of experience "is included to capture the concavity of the experience earnings profile" (Harmon et al, 2003, p. 117), Z is a vector of other variables which could be included, such as socio-economic background, and ε is the random error term. To obtain RORs, the value of coefficient b is used. As the factor S represents the years of education completed, b gives the average rate of return

for an additional year of education regardless of the educational level this year refers to (Psacharopoulos, 1995)[4]. Mincerian RORs can be further measured per educational level by including a dummy variable representing each level. While this type of ROR takes into account the indirect costs of education (i.e. foregone earnings), it disregards the direct costs of education, such as tuition fees.

This method is the most widely applied technique, because in most cases the data available constrain the use of the elaborate method. However, this method has various disadvantages and criticisms. From the theoretical point of view, its validity runs parallel with the validity of the HCT, on which it is based. It basically assumes that age-earnings profiles for various levels of education "are vertically parallel to one another once workers enter employment, and that workers never retire" (Johnes, 1993, p. 30). Johnes, however, argues that the empirical effect of such limitations is negligible by taking into account the overwhelming empirical evidence that age-earnings profiles are roughly parallel throughout working lives. The length of the working life, according to Johnes in practice, means that the present values of later years' benefits tend to be unimportant as long as market interest rates, which are typically applied to discount future values, remain non-negligible. However, in the case of high unemployment, especially in the early periods of working lives, Mincer's method would seriously overestimate/underestimate the ROR, as unemployment impacts both sides of the calculation, the benefits and the costs. The existence of unemployment after graduation decreases the benefits of education, and, on the other hand, it decreases the opportunity costs of the time spent by students undertaking education. Mincer's method may further suffer from upwards/downwards bias due to the empirical difficulties of capturing all the benefits and costs of education, such as consumption elements (Hough, 1996). This

applies equally to the measurement of social rates of return, where it is possible to include some of the benefits, such as before-tax earnings, but it is far more difficult, if not impossible, to include measures on the externalities spilling over to society. Also, foregone earnings implied in Mincer method do not represent the whole social costs of education borne by society.

However, the most well-known difficulty associated with the analysis of the causal relationship between education and earnings, based on the Mincerian approach, is how to avoid the biases of unobserved but relevant factors, notably ability and family background factors, where the latter influence the former as well. Recently, dozens of studies have emerged to deal with such a difficulty with a remarkable variety of econometric tools using diverse data sets. Simply put, in addition to the theoretical challenge implied by the SSH regarding the partial role of innate ability on earnings, econometrically the assumption implied in equation 4.4 is that the error term is not correlated with the explanatory variables (i.e. education is exogenous), which is not the case since education is endogenous to ability and family background as well (Harmon et al, 2003; Card, 2001).

A substantial number of the recent econometric innovations have been motivated by the intention to extract the pure influence of education on earnings and to neutralise the impact of unobserved variables (or to deal with the so-called endogeneity biases). One famous recent approach has been to apply microdata on monozygotic twins (see, for example, Ashenfelter & Krueger, 1994; Ashenfelter & Rouse, 1998; Behrman & Rosenzweig, 1999; Lee, 2000; and more recently Miller et al, 2005)[5]. In general, the methodology followed by 'twins' studies of RORs involve measuring the return to

education as the *difference* in earnings gained by twins with different education levels. In do so, the studies are based on the fact that the monozygotic twins are scientifically identical and most likely to grow up in the same environment. This fact enables the researcher to instrument for unobservable relevant variables that influence education and earnings, particularly, native ability and family effects. The research findings on rates of return using twin data are described as most reliable (Psacharopoulos & Patrinos, 2004); however, they differ quite dramatically with respect to the direction of bias (upward/downward) and the magnitude of the latter in RORs (Carnoy, 1997). Card (2001), however, mentions that the effect of education on earnings, on average, is biased by no more than 10% using OLS techniques when compared to RORs measured using these recent techniques motivated with the aim to adjust for ability and family influences.

4.5 An overview of the rate of return (ROR) literature

Unlike studies of perceived or expected rates of return ERRs (see next chapter) the literature of RORs estimation is ample and has grown exponentially. Consequently, to give a comprehensive review of such a literature is rather difficult and beyond the scope of the present study. Therefore, this section provides a general overview of international trends and findings on ROR. To do so, most recent reviews conducted by economists are emphasized, particularly this by Psacharopoulos & Patrinos (2002; 2004). Also, this section discusses empirical literature on the rates of return in Jordan, which is rather sparse.

4.5.1 International evidence on RORs

Based on HCT interpretations, economists often distinguish theoretically between human capital stocks accumulated during four distinct stages over an individual's lifecycle: early accumulation, mainly acquired over early childhood at home, human capital obtained through formal education, human capital accumulation from on-the-job training, and human capital accumulated and maintained after retirement mainly through lifelong learning activities (De la Fuente & Ciccone, 2002; Leibowitz, 1974).

However, the vast majority of empirical studies have concentrated on the labour market return, using mainly the Mincerian method, of human capital augmented through formal education, as the latter is the component of human capital that is the easiest to measure (De la Fuente & Ciccone, 2002).

Human capital investment appears attractive in comparison with alternative assets, both from the macroeconomic and microeconomic perspectives. At the macroeconomic level, the debate on human capital has taken a new turn, focusing on the role of human resources in economic growth through producing, using and disseminating technological innovation (De la Fuente & Ciccone, 2002; Maudos et al, 2003; Sianesi & Reen, 2003). However, as indicated above, the empirical evidence on the human capital spill-over benefits or externalities is scant and inconclusive, through providing some support for HCT (Sianesi & Reen, 2003; Venniker, 2001), reflecting the fundamental difficulty facing economists in identifying/quantifying the social benefits of education. One of the few recent studies attempting to quantify the social rate of return to HE is Moretti (2004), which found positive externalities generated by increasing the supply of college graduates in some cities in the USA. Worldwide evidence on social RORs

suggests that the latter are lower than their private counterparts by around two points (Psacharopoulos & Patrinos, 2002; 2004).

At the microlevel, according to Psacharopoulos & Patrinos (2002; 2004), there are some general steady trends and characteristics of estimated RORs. Most importantly, the findings of the majority of studies are consistent with human capital theory, affirming the validity and importance of the human capital hypothesis for interpreting wage differentials and variations in individuals' investment in further education. Psacharopoulos & Patrinos observed that internationally ROR varies inversely with per capita income. Those investing in education in low-per capita income countries are expected to reap higher rates. This is possibly due to the fact that the stock of human capital in some countries is accumulated less and therefore an increase in investment in human capital would result in higher returns. However, this conclusion is not valid with respect to the MENA group of countries, which are found to have the second lowest rates of return in the world (jointly with non-OECD European countries) after OECD countries (see Table 4.2). Findings on MENA considered in this review do not include Jordan, reflecting the scarcity of ROR studies in this developing country. Psacharopoulos & Patrinos also observed some other important patterns relating to education and HE, which are summarised as follows:

1. The international average private ROR is around 10%, compared with 10.6% reported in Psacharopoulos (1994). The authors suggested that this reduction by 0.6 may be attributable to the increased stock of human capital (supply of education) all over the world.

2. Private RORs to HE are increasing. As a result, the authors argued that the current pattern of public subsidization, which increases with the level of education and may lead to worsen income inequality, should be consistent with social rates, which decrease with level of education.
3. Women in general obtain on average higher RORs, especially for secondary and higher levels, than men, who in turn obtain higher rates from primary education. However, this result does not mean that women earn more. Instead, this pattern reflects the differentials between women's earnings for various levels of education, which are higher than men's.

Table 4.2, from Psacharopoulos & Patrinos, shows the private and social rates of return by area and level of education.

Table 4.2 Returns to investment in education by level, latest year, regional averages (Percentage)

	Rate of return type					
	Social rate			Private rate		
	Educational level			Educational level		
	Primary	Secondary	HE	Primary	Secondary	HE
Region	Mean	Mean	Mean	Mean	Mean	Mean
Asia*	16.20	11.10	11.00	20.00	15.80	18.20
Europe/Middle East/North Africa*	15.60	9.70	9.90	13.80	13.60	18.80
Latin America/ Caribbean	17.40	12.90	12.30	26.60	17.00	19.50
OECD	8.50	9.40	8.50	13.40	11.30	11.60
Sub-Saharan Africa	25.40	18.40	11.30	37.60	24.60	27.80
The Whole World	18.90	13.10	10.80	26.60	17.00	19.00

Source: *Table A1 Psacharopoulos & Patrinos (2002).*
* *Non-OECD.*

4.5.2 RORs studies in Jordan

The literature on RORs in Jordan is in all respects underdeveloped and little. There has been only two recent studies, by Talafeh (2003) and World Bank (2003). As Talafeh

points out, despite the increasing importance of education and its returns from the economic point of view, and the increasing demand for HE, earlier studies estimating RORs are rare and out of date (i.e. Rawabdeh, 1984; Share, 1980). The latter two studies are unpublished PhD theses. Rawabdeh (1984) used the labour force survey for 1975 to estimate returns to education by applying the standard version of the Mincerian approach. The other study (Share, 1980) utilised a sample of Jordanians working in Kuwait at the time to proxy for Mincer-type RORs in Jordan.

Talafeh (2003) used QLFS, which was carried out by the DOS in Jordan over four rounds during February, May, August and November 2000. The sample of the survey consisted of 35,200 persons, of which around 88% were male workers, from the twelve Jordan governorates. On the other hand, World Bank (2003) applied data dates back to the Household Survey of 1997. This study estimated RORs only per educational level. It reported different measures of RORs in comparison with Talafeh (2003), possibly due to differences in the data used and the time of data collection. Nevertheless, both studies produced similar evidence on RORs for secondary and HE. University education was found to return feasible rates exceeding 9%, while both studies reported that the secondary education resulted in low returns and did not exceed 3%. Since Talafeh (2003) used more recent data and estimated RORs on average, per educational level and gender, more attention is placed on his results here.

Talafeh applied the Mincerian method to calculate RORs based on monthly gross earnings. He estimated RORs for an additional year of education as well as for each educational level and found that the average ROR to a year of education is around 5.5% for the whole sample. It was estimated to average around 5.0% and 7.6% for males and

females respectively. Compared with the international trends cited in Psacharopoulos & Patrinos (2002; 2004), in which the average rate of an additional year was 10%, Jordan would tend to have a lower average rate. However, consistently with the international trends, women in Jordan appeared to obtain higher rates on average than men.

Regarding different educational levels, Talafeh found that RORs, regardless of sex, vary between 1.39% for elementary education and 17.15% for Master degrees (MA), see Table 4.3. Concerning university education (Bachelor degrees), rates of return were 8.85%, 9.7% and 12.22% for the whole sample, males, and females respectively. Secondary education resulted in poor returns; 1.43%, 1.36% and 0.17% for the whole sample, males and females respectively. The highest return was found to be reaped by females gaining post-MA degrees, at about 20.3%. Unsurprisingly perhaps, therefore, Talafeh suggested that demand for HE has increased due to such rates, in spite of unemployment.

Table 4.3 Rates of return by level of education in Jordan[6]

Education level	Total	Males	Females
Elementary	1.39	1.31	-0.72
Preparatory	4.06	4.06	7.08
Secondary	1.43	1.36	0.17
University	8.85	9.7	12.22
MA	17.15	16.35	16.25
Post-MA	14.3	13.32	20.3

Source: *Talafeh (2003)*

Some implications and concerns arise from the evidence provided by Talafeh:

- Returns to the first degree after secondary education were positive and exceeded 8.8% relative to secondary education. However, the research did not measure the

ROR to the other undergraduate type of HE, namely community college education which in turn was found to return high rates in World Bank (2003), amounting to 9.2%. In addition, the study utilised the conventional Mincerian method, ignoring the implications of ability and family background bias.

- Females tend to reap higher rates of return in post-secondary education, particularly undergraduate education. This would be attributed to the fact that employability and earnings for females with only secondary education are lower than those for males, resulting in less opportunity costs for females and greater earnings differentials.
- The study also measured the RORs on average for HE and did not consider different HE specialisations or fields.
- Surprisingly, RORs to secondary, elementary and preparatory educations are lower that those for HE. These patterns are not consistent with those observed internationally. Talafeh does not provide a particular explanation for this phenomenon. A plausible explanation is that the public sector size is large in Jordan, leading to characterising the labour market with credentials tendencies. This is expected to lead earnings not to reflect properly the effect of education on productivity.

4.6 Conclusion

This chapter has considered the economic theoretical ground of demand for HE. Quite simply, the economic thought perspective on education, which is dominated by the views of HCT, considers demand for HE as an investment in human capital leading to higher earnings in the future. HCT contends that expenditure on education is socially justifiable as it enhances individual productivity and, in effect, the collective output of a

society. In contrast, the SSH accepts in its strong version that more educated people earn more, but argues that this is due to information imperfection in the labour market, not because of any productivity-enhancing effect of education. However, with respect to individual decisions concerning HE, both theories agree the notion that students rationally demand HE based on a process of weighing up benefits of education against its costs. In spite of the fact that the investment element appears to dominate the economic thought on education, economists also accept that education results in consumption benefits, which probably influence the demand for HE.

In order to observe the return from individual and public investments in education, and to interpret and forecast demand for education, economists have developed various methods to measure/estimate RORs. The most widely used method is the well-known Mincerian method, which estimates RORs using multiple regression analysis of earnings. However, this method does not always demonstrate the actual RORs, since some of the benefits and costs of education are either not measurable or are ignored due to data problems. Also, this method has been modified to more precisely reflect the pure effect of education on earnings and isolate the influence of native ability and family background factors.

This chapter has also provided a brief discussion of the empirical evidence concerning RORs, which suggests that returns to HE education are substantial and have increased in recent years. In Jordan, there has been a paucity of the empirical evidence on RORs. Recent two studies conducted in 2003 came after two studies carried out prior to the mid-1980s. The studies showed that HE education seems to be a worthwhile investment from an individual standpoint. They also suggested that higher RORs to HE are a

possible explanation for the increased student demand for HE in the country. However, this suggestion has not yet been empirically tested.

The next chapter considers the empirical literature on demand for HE, placing more emphasis on studies applying earnings expectations to measure ERRs and linking them with education decisions.

[1] Kiker (1966) and Cohn & Geske (1990) provide wide-ranging historical discussions on the economic views on education, including the classical interpretation.

[2] The new endogenous growth models and augmented Solow models supported by empirical studies also confirm education as central to the process of economic growth (McMahon, 1997; 1998). Barro & Lee (2001) find, using time series data for 1960-1995, that the human capital stock is a fundamental factor of economic growth in many countries in the world.

[3] Most of the studies that have concentrated on non-monetary benefits are surveyed in Wolfe & Zuvekas (1997).

[4] As the dependent variable (earnings) is expressed in *log*, when the independent variable (S) increases by one unit (a year of education), assuming that the only cost of education (Y) is foregone earnings, as in the Mincerian method, will result in increasing earnings by about 100b%. The method implies that earnings profiles are parallel for different years and levels of education and that worker live for ever, as mentioned above. The present discounted value (PDV) of the investment in education is therefore, given the latter assumptions, bY/i. The internal rate of return *i* then can be measured by equating the PDV of the investment in education to the educational costs (foregone earnings), which means that *i*=b.

[5] Many criticisms have been raised as for the use of twins' data to measure the pure effect of education on labour market rate of return (see Bound & Solon, 1999 and Neumark, 1999). For comprehensive details on econometric innovations that have been used to encounter the theoretical and empirical difficulties involved in the detecting the causal effect of education on earnings, see Card (1999) and Blundell et al (2005). In this regard, Card (1999) briefed on the use of instrumental variables (IV) to better reflect the influence of education on earnings. For example, he mentioned that some studies had used the minimum school leaving age, as an institutional source of schooling variation, to solve the endogeneity of schooling (to ability and family background). Griliches (1979) also reviews earlier work on the use of sibling data as IV to control for ability and family background environment.

[5] Before the late 1980s, compulsory education in Jordan was divided into two stages; elementary education (from ages 6-12) and preliminary education (from ages 12-15). The sample of the above study contained differently aged individuals where some possibly obtained their education under the old system. In the current system, as shown in Chapter Three, compulsory education consists of one stage (basic education), however with extra years (16 instead of 15).

CHAPTER FIVE
DEMAND FOR HE AND EARNINGS EXPECTATIONS: EMPIRICAL LITERATURE

5.1 Introduction

The major ingredient of benefits of education occurs in labour market in the subsequent period after education (See Chapter Four). Therefore, earnings expected by individuals on the verge of making decisions on HE are assumed to play a central role in shaping such decisions. In this regard, Dhesi (2002) restated what Williams & Gordon (1981) pointed out earlier about the importance of detecting ERRs and the assumption that they impact upon education decisions:

> The implicit assumption [in economic theory] is that students and potential students are aware of returns and act upon them. However, a high rate of return is relevant to the post-school educational decision only if this return is so perceived by students (p.418).

The examination of subjective earnings expectations therefore is indeed of particular theoretical and practical significance not least due to their influence on student demand for HE. Challenges facing HE systems, like over/under education and more generally the mismatch between education and the labour market may be to some extent caused by distorted HE decisions resulting from inadequate perceptions, or unreliable expectations of the rewards of education, perhaps as a consequence of lacking the necessary information.

Despite the theoretical and practical importance of the latter fundamental possibilities, comparatively little attention has been paid to the investigation of subjective earnings

expectations and examining their role in students' education decisions and choices. Regarding this fact, Webbink & Hartog (2004) point out that:

> Considering the pivotal role of expectations in the choice process, one would expect that the expectations of pupils and students have been studied extensively. Such is not the case, however (p.103).

Amongst the studies examining the realism and variables of earnings expectations, some studies have applied the latter in various ways to measure (ERRs) to HE and to further apply them in detecting why students decide to opt for HE. This approach remains rare, despite its importance. The other two approaches to student demand for HE have typically been used instead with cross-sectional and time series data.

The current chapter reviews existing work on earnings expectations and ERRs and student demand for HE. Apart from this introduction, it is structured into two broad sections. The first is concerned with studies of earnings expectations and ERRs. The second reviews evidence on the influence of ERRs on student demand for HE and insights gained into the role of other variables as well.

5.2 Earnings expectations and ERRs studies

Studies in this field have recently proliferated; however, they remain relatively few compared to the ample literature on RORs and actual earnings functions. They, however, differ considerably in terms of methodology and underlying research questions. In general, however, the existing literature has addressed key issues related to earnings expectations, notably in the following three areas (which will be considered in turn in the next three subsections):

1. A group of studies pertaining to earnings expectations have drawn attention to calculating ERRs. Some of these studies have further applied measured ERRs in investigating their influence on post-secondary educational plans/decisions (section 5.3).
2. Some work has questioned the capability of students to expect earnings accurately. In a related and important vein, some studies have examined whether students' earnings expectations deviate from prevailing actual earnings.
3. Analogously to actual earnings functions, some studies have involved an investigation of the variables that mediate discrepancies in students' earnings expectations.

Some of the available literature has addressed more than one of the three areas outlined above, and most of the work cited in the next sub-section will appear elsewhere in subsequent sub-sections and in section 5.3.

5.2.1 ERRs studies

Applied economists have imitated RORs methods (see Chapter Four) in their attempt to design techniques to measure/estimate ERRs using subjective earnings expectations. As for the measurement of ERRs, some of the studies involve applying the elaborate method; others use methods similar to the earnings function, while the rest resort to the short-cut technique. Equivalent to the case of realised earnings data, the studies of the elaborate and earnings function methods for ERRs draw on what are called crude expected age-earnings profiles, from which economists also construct what is termed expected lifetime earnings. To generate crude expected age-earnings profiles, some of

the work in this area asked student participants to report a set of earning expectations on starting and future earnings. The majority of the studies (Botelho & Pinto, 2004; Dhesi, 2002; Ferber & McMahon, 1979; McMahon & Wagner, 1981; Menon, 1997a; Williams & Gordon, 1981) assumed that expected-age earnings profiles would reflect the concave shape of actual profiles, which peak at a particular point (between the ages 40 and 50) existing in the labour market. An exception was the study carried out by Bosworth & Ford (1985), which was based on a six-point expected age-earnings profile, assuming that students might expect to earn more even after the peak point. On the other hand, the short-cut method for ERRs relies entirely on a single earnings expectation per educational level (i.e. students' expected starting earnings) as in Psacharopoulos & Sanyal (1981; 1982); Menon (1997a), and, more recently, Hung et al (2000). A general methodological distinction which should be kept in mind when looking at the findings of ERRs studies is that some studies asked each respondent to expect earnings based on his/her intended education, while others further asked the students about the relative earnings rates if they were to opt for alternative education levels. For example, in the studies of Bosworth & Ford (1985); Hung et al (2000) and Menon (1997a) each student participant reported starting and future earnings in two different scenarios (if employed with HE or employed with secondary education instead). This method enabled these studies, unlike the rest, to discover individual perceptions on the opportunity costs and, in effect, to measure ERRs per student and not only for the whole sample or per education group. This, in turn, allowed Menon (1997a) and Hung et al (2000) to further econometrically test the influence of ERRs on the student demand for HE (as proxied by education intentions).

Overall, studies based on composing crude expected age-earnings profiles, through further asking the students about future earnings, assumed the non-existence of inflation, which is much less problematic in case of short-cut ERRs (see below).

In the remainder of this section, the evidence produced in this area will be reviewed; starting with the studies based on expected age-earnings profiles and expected lifetime earnings. Subsequently, the studies employing the short-cut method will then be presented. Following the review a discussion is given of the disadvantages and advantages of the short-cut method compared with the other two methods.

5.2.1.1 ERRs using crude expected age-earnings profiles

Williams & Gordon (1981) published one of the first empirical attempts to measure perceived or expected rates of return. It is the first study to analyse economically earnings functions as perceived by pupils who are at the stage of making decisions on whether or not to stay on in full-time education. The study was based on a survey administered to a sample of 16-year-old students in England. Besides questions on personal and socio-economic variables, including innate ability and educational plans, it asked each student about their anticipated earning capacity at three stages of their working lives, at the start of working life: at age 26 and at age 46. These later three points of earnings expectations were used to construct crude expected age-earnings profiles for three groups (those who intended to continue into HE, to continue into secondary education then terminate, and those intending to enter the labour force at the age of 16). Based on these profiles, Williams & Gordon first constructed undiscounted expected lifetime earnings disregarding inflation and assuming that earnings increase linearly between each of the three expected points and peak at the age of 46. The

undiscounted lifetime earnings were then first applied to scrutinize the variables influencing expected earnings. After controlling for many variables, including sex, social background, and student ability, the study found that the intention to continue into more education was responsible for significantly explaining the major variation in undiscounted lifetime earnings (with alpha coefficients ranging around 60% for HE). Secondly, to measure the ERRs to HE (or perceived private rates of return to HE as referred to by William & Gordon), the study also conducted OLS regressions to arrive at the internal rate of return (or discount rate) that made the present value of expected lifetime earnings for those intending to continue into HE equal to those who planned to terminate at secondary education. The same procedure was carried out to calculate the rate of return for secondary education relative to those intending to leave school at age 16. Despite some differences, Williams & Gordon's applied approach can be considered as comparable to the earnings function (in equation 4.4) used to calculate internal private rate of return, as both make it possible for the researcher to control for other variables while trying to extract the influence of education on earnings/expected earnings. Returns to education as perceived by the students were found by this study to be positive for HE over secondary education, and for the latter over compulsory education. Boys in general expected to have higher rates than girls (13% compared to 9.9% and 21.6% compared to 11.7% in cases of HE and secondary education respectively)[1].

In a similar attempt to measure rates of returns as expected by students, Bosworth & Ford (1985) elicited undergraduate students' earnings expectations at Loughborough University. However, this study differs from Williams & Gordon in three respects: the sample was markedly smaller, the sample was drawn from undergraduate students, and

ERRs were measured based on the elaborate method, similar to equation 4.1. Also, instead of asking students to report earnings expectations on their own future earnings, as in Williams & Gordon, this study asked the respondents to further anticipate future earnings points assuming that they did not continue into HE and instead entered employment with only secondary education. Bosworth & Ford's survey elicited earnings expectations for six future points, rather than three as conducted by Williams & Gordon. Interestingly, they reported that perceived earnings streams do increase after 45 years and until retirement, unlike the assumption accepted by Williams & Gordon. The rates of return calculated by Bosworth & Ford emphasized the gender gap in favour of males and were nearly twice as large as those reported by Williams & Gordon. The authors attributed this difference mainly to sampling and methodological differences.

The study of Menon (1997a) mixed the approaches used by the latter two studies. It computed private rates of return as expected by a sample of Cypriot secondary students using both the elaborate method, like Bosworth & Ford, and the short-cut method. Similar to Williams & Gordon, Menon first constructed expected lifetime earnings streams for secondary and HE based on the three-point approach, however for each respondent rather than just for the whole sample. Each participant was asked to give estimates on future earning expectations if working with and without a HE education degree. Further, respondents were asked to report their expectations regarding the costs of HE. Consequently, these procedures allowed Menon to calculate an ERR for each respondent, which further permitted her to plot a regression relationship, for the first time, between perceived return to education and post-secondary education decisions (see section 5.3). In the case of the elaborate method, Menon found that the ERR, adjusted for foregone earnings and expected HE costs, perceived by the whole sample to

be positive (around 5.7%). Interestingly, the study identified that those intending to continue into HE perceived considerably higher rates than their intending-to-work peers, suggesting a strong relationship between intention to continue in education and the expected reward from HE degrees (6.7% compared to 1.5%). Short-cut rates revealed similar trends and were quite comparable to elaborate rates (see the following sub-section).

The use of constructed expected lifetime earnings, based on expected age-earnings profiles, were recently applied by Dhesi (2002), based on a survey carried out in 1993 to elicit the earnings expectations of a sample of Indian secondary students. The survey also incorporated gathering students' responses in terms of socio-economic background factors (parents' education, monthly familial income, wealth status, ability, perceptions of change in marriage prospects with HE, and geographical locations), which were applied alongside earnings expectations by Dhesi (2001) to explore post-school choices (see section 5.3). The analysis and methodology used in Dhesi (2002) was to a great extent similar to that followed by Williams & Gordon. ERRs were computed for different types of HE, employing two hypothetical earnings peak points (45 and 50 years). Also, ERRs were measured for the whole sample, not for each participant, using the elaborate method. The ERRs to HE measured by Dhesi were found to acceptably match those pertaining to private rates measured using realised earnings data in earlier Indian studies. Using the age of 45 as the peak point, ERRs varied between 13% and 16.5%.

A recent study in this field is Botelho & Pinto (2004), which was based on a survey administered to a sample of freshmen and senior students at the University of Minho,

Portugal. The study used a controlled experimental design to elicit earnings expectations by dividing the sample into groups, with each group facing different scenarios in the questions asked. Part of the sample was asked to answer questionnaires with monetary incentives being introduced, in order to encourage higher accuracy of responses. Another group differed in the sense that these students were asked not only to forecast average earnings for a typical worker with and without college education, but also to forecast their own earnings. The study found that there was no significant difference between earnings expectations reported by those given monetary incentives and those not, suggesting that students tended to respond meaningfully to questions eliciting their earnings expectations. As a result, the authors pointed out that "economists' reluctance to gather subjective data on expectations does not seem warranted" (p. 651). Also, the study indicated that students largely did perceive returns to college education. Unlike Williams & Gordon (1981), Botelho & Pinto used the exact Mincerian method specification, as in equation 4.4, to measure ERRs, which were found to fall around 13%, with male students expecting higher returns than their female peers.

5.2.1.2 ERRs using the short-cut method

A number of ERRs studies have utilised the short-cut method. In Chapter Four, it was shown that this method is recommended in the case of the availability of actual mean earnings per educational level. In the case of ERR, this method has been utilised using starting earnings expectations. The short-cut procedure gives an approximate estimation of returns relying on converting the formula for returns into a simple linear function. In the case of HE, the short-cut expected rate is:

$$ERR = \frac{ES_2 - ES_1}{n.ES_1} \qquad \text{Equation 5.1}$$

where ES_2 and ES_1 represent expected starting earnings (per month multiplied by 12 to become annual) reported by the students conditional on being employed with HE and secondary education respectively. n denotes the number of years typically spent in undergraduate education which is ,on average, 4 years in the case of Jordan. This formula implies that there exists just one kind of costs, foregone earnings, representing the opportunity costs of being involved in HE. One could, however, include the annual direct costs of HE by adding the term C, which stands for annual direct costs, to the above equation, which then becomes:

$$r = \frac{ES_2 - ES_1}{n^*(ES_1 + C)} \qquad \text{Equation 5.2}$$

In the above two equations, the dividends represent the net gains or benefits of continuation into HE, while the divisors measure the direct and indirect costs of HE.

The short-cut method was first developed and utilised by Psacharopoulos & Sanyal (1981), in a study conducted with a large sample of Philippino HE students and recent graduates. The overall ERRs produced (*ex ante*, as called by the authors) averaged at 7.3% and 5.2% in the case of including merely the foregone earnings, and adding a measure of the direct costs of college education respectively. Psacharopoulos & Sanyal (1982) adopted the same approach to measure short-cut ERRs in the context of nearly 2,000 HE students and 1,700 university graduates in Egypt. The Egyptian study specified that ERRs, assuming foregone earnings to be the only cost, were 15.4% and 14.5% for males and females respectively. Besides the adoption of the elaborate method, Menon (1997a, see above) measured short-cut ERRs for Cyprus and found them to be slightly higher than the elaborate ERRs. They ranged around 6% for all

students in the sample using the short-cut method and were found to be much lower than the private rates of return measured in earlier Cypriot studies. Finally, the short-cut method was applied by Hung et al (2000) on more than 1,500 Chinese secondary students. In order to explore the influence of ERRs on education decisions, the students were further asked to report their post-school education choices and socio-economic background information (see section 5.3). The mean ERRs to HE, assuming both foregone earnings and a measure of actual costs of HE, found by Hung et al were high, ranging between 19.21% and 33.95% for those intending to work and intending to study respectively, suggesting a strong relationship between perceived labour market returns and demand for HE.

Compared with methods based on the approximation of age-earning profiles, the short-cut method enjoys certain advantages. However it is less appealing from a theoretical point of view as it transforms the relationship between earnings and age (experience) into a linear one ignoring the concavity of age-earnings profiles. Yet, one could not conclusively decide whether the short-cut ERRs would over-underestimate ERRs based on expected lifetime earnings, and by how much. Firstly, it is not necessarily legitimate to assume that expected age-earnings profiles are analogous to the concavity of actual earnings profiles, and, in effect, to choose a particular point in time to proxy for that. Empirically, for example, Bosworth & Ford (1985) supported this as they found earnings expectations to continue increasing even after the assumed peak points. Secondly, this is dependent upon the discount rate (which can be assumed, in practice, to equal the market interest rate) and on the earnings expectations of respondents for career entry and later periods.

In general, the short-cut method is much simpler, whereas the other methods are more difficult in terms of application and design. For example, as mentioned above, ERRs studies involving asking students to predict later earnings (5, 20 or 25 years later) ignore the implications of inflation either by instructing participants to do so or implicitly. Therefore, some studies have found it more beneficial to instruct the students to think as if future earnings were happening now (Williams & Gordon, 1981). While this procedure promotes a greater ease of comparison of ERRs and actual returns in the labour market, it would not reflect properly the full picture of students' expectations of future earnings. Asking students, especially youngsters, about earnings which may apply in 20 years or more time from now is actually not an easy task, and may influence the quality of data gathered. These problems, of course, are much less challenging in ERRs based on the short-cut method, where merely the expected starting earnings are used and assumed to be better known by the students. The difficulty resulting from inflation, besides the other practical problems related to question wording design and data gathering could have helped to hinder advances in research in the area of students' earnings expectations. In the current thesis, it was realised at the stage of designing the questionnaire, and later in the pilot studies, that it would be more beneficial to the study to adopt the short-cut method for practical concerns, which are related to the quality of data collected (see Chapter Six).

5.2.2 Evidence on accuracy of students' earnings expectations

The examination of the realism and accuracy of students' earnings expectations is important, and therefore, a growing number of studies have involved testing it directly and indirectly, amongst other related-to-earnings-expectations issues. In an examination

of the studies of ERRs reported in the previous sub-section, the majority implicitly or explicitly supported the notion that earnings expectations built subjectively do correspond to the actual earnings experienced in the labour market. Williams & Gordon (1981) pointed out that the shape of expected earnings profiles was consistent with those observed in the labour market, implying that students perceive quite closely the benefits associated with education. Likewise, the ERRs measured by Dhesi (2002) were found to be comparable to private rates measured in earlier studies for India. Psacharopoulos & Sanyal (1981; 1982) pointed to the fact that ERRs/earnings expectations in the Philippines and Egypt were remarkably realistic and close to the actual returns. Further, the latter two studies concluded that HE students have realistic perceptions of the levels of earnings, and of the gender-pay gap, that they will encounter upon graduation as well as ten years later in the labour market. Using starting earnings upon graduation, students were found to make extremely realistic assessments of the foregone earnings of being in college education. In contrast to the later studies, Menon (1997a) found that ERRs differed noticeably from others measured using actual earnings in Cyprus. Nonetheless, the difference between the expected or perceived return and those actually existing in the labour market might result from the diversity in methods used, type of data measured and the time of data collection. For instance, it is perhaps controversial to contrast ERRs measured using data collected in the early 1990s with RORs measured using data collected from the labour market in the early 1980s, as carried out in Dhesi (2002).

Besides the above-analysed ERRs studies, some studies have focused on earnings expectations, their accuracy and degree of deviation from current prevailing earnings rates and variables causing variations in earning expectations, rather than on measuring

ERRs. This sub-section reviews the empirical evidence on the accuracy of earnings expectations and their deviation from actual earnings in the labour market.

The evidence on the capability of students on the verge of entering HE or of entering the labour market in secondary schools and universities to expect realistically labour market rewards associated with different types of education has not been conclusive. Some of the few empirical studies conducted have indicated that students have a pronounced tendency to overestimate realised earnings pertaining to employment with different educational levels. On the other hand, other studies have provided contrary evidence. Different evidence on this theme persists even within some of the studies themselves as in Nicholson (2005), which is the most recent study in this area. Using panel data from 1970 through the late 1990s in the USA, it indicated that medical students overestimated the earnings of physicians in the 1970s, while they currently underestimate them by 25%. The remaining part of this sub-section briefly reviews the major evidence available in the relevant studies, focusing first on work documenting overall students' tendencies to over/underestimate the pay-offs of education.

5.2.2.1 Evidence on under/overestimation of earnings expectations

Smith & Powell (1990) elicited college seniors' expectations in two midwestern universities in the USA, largely aiming to detect the realism of and differences in earnings expectations as opposed to contemporaneous actual earnings. Having asked the students to forecast their own starting earnings in the first year of graduation and ten years later, and eliciting the same predictions for the average member of their class and simultaneously for their high school peers who did not pursue college education, the study found that while students were capable of anticipating reasonably their peers'

mean earnings, they, and especially males, tended to overestimate their own future earnings[2]. Blau & Ferber (1991) questioned a sample of undergraduate students at the University of Illinois, and came to the same conclusion as Smith & Powell, as both females and males were found to be overoptimistic about their own earnings. In this study, respondents were asked to report their earnings expectations at the beginning of their career, and 10 and 20 years after graduation. It was, moreover, found that females anticipated earning very similar salaries upon graduation to males. However, the perceived gender gap appeared to increase when students were asked to predict future earnings. In a large study involving 6,000 university students from ten European countries, Brunello et al (2001; 2004) indicated that students overestimated earnings for college education, and also overestimated the net gain from enrolling in HE compared to employment with high school education, irrespective of gender. This work contained earnings expectations questions asking students to give their forecasts as a form of point estimates in the following contingencies: monthly starting salaries and monthly earnings ten year after graduation in the case of only having high school education, and estimates on the same points when graduation with college education. Wolter & Zbinden (2002) further granted some support to the latter findings through a survey conducted in Switzerland. After comparing actual wage data with expected earnings, on average the study found Swiss students to be significantly overoptimistic in terms of university education (for both the starting and ten-year ahead expected salaries). Regarding the earnings expected for employment without a HE degree (with only secondary education), the respondents gave accurate starting earnings expectations but underestimated future earnings, leading to overall overestimations of the net gain of bearing HE degrees. With respect to HE fields, the study indicated that significant deviations from actual wages can be observed for law students, students of social and

human sciences and students of natural, technical and computer sciences. In contrast, students of economics and medicine made expectations that were much closer to actual wages. Regarding wage gains expectations in the first ten years of professional experience, students appeared consistently to perceive higher gains than actual ones, with females having the lowest degree of overestimation.

5.2.2.2 Evidence on the capacity to make accurate earnings expectations

In opposition to the above evidence, some studies support the notion that students are capable of making quite accurate earnings expectations. Betts (1996) reported no great divergence, on average, between earnings expectations and realisations, especially at the entry level. This study sampled nearly 1270 students from the University of California, who proved to have accurate perceptions of the gains associated with a college education. However, interestingly, it was evident that the degree of accuracy increased with number of years in college, proving the importance of labour market information in correcting earnings expectations[3]. Newer students in this respect were proved to possess less knowledge about expectations in comparison with their final year peers. The results about the capacity of students to make quite accurate earnings expectations were reaffirmed by Dominitz & Manski (1996). The main conclusions drawn from their explorative study were that students in the USA were capable of making realistic predictions of future incomes and that students did perceive that more education would lead to higher earnings. Nonetheless, the study found that respondents tended to overestimate the current degree of earnings inequality in American society. In another American study, Carvajal et al (2000) viewed students as capable overall of making quite realistic earnings expectations, irrespective of gender. The latter work contrasted earning expectations reported by college students with actual earnings reported by

recent college graduates from Florida International University. Interestingly, the authors concluded that students built their expectations on the prevalent trends of recent graduates' marketplace earnings. Wolter (2000) replicated, with a few modifications, the study of Dominitz & Manski (1996) for the purpose of exploring wage expectations of Swiss university and secondary students, and also compared them with the American results. Wolter concluded that students' expectations about future earnings do not significantly deviate from the currently observed earning structure in the labour market, suggesting that return to education derived from current cross-sectional realised earnings data was a trustworthy proxy of the returns perceived by students. Hungarian secondary-school students were also shown to have fairly accurate knowledge of current wages according to educational levels as reported in Varga (2002). This study carried out a survey asking participants to mark three points on the age-earnings profile, at entry level, age 30 and age 40, for them and for an average worker with and without HE. Similar findings were reported by Webbink & Hartog (2004) regarding earnings expectations elicited from Swiss students. Innovatively, and uniquely, Webbink & Hartog compared students' earnings expectations with their earnings realisations four years after the initial survey. A series of OLS regressions was carried out to investigate whether the structure of the determinants of realised earnings was similar to that of the expected earnings reported four years earlier. The study found that the explanatory variables had to a great extent similar signs and sizes of effects on the dependent variables (expected earnings and realised earnings). Female participants, for example, were found to have quite accurate perceptions regarding the percentage difference of their earnings relative to male students. In this respect, females expected to earn 5% less than male students and realised four years later earnings that were less than those of males by around 6%. The overall findings of the study showed that the types of HE

affected the expected and realised earnings by signs and sizes that were remarkably very close. Apart from students in language studies, who substantially overestimated their earnings, students anticipated differentials in earnings between HE fields quite well. However, marks received at secondary education level, for science students were found to influence expected earnings, but were not found to translate into realised earnings since their effect was insignificant four years later. Also, students from high income families tended to be overoptimistic about their future earnings. Nevertheless, the study supported the overall conclusions of many earlier studies, such as Dominitz & Manski (1996), that "students are capable of making realistic estimates of future incomes not only hold at the group level but also at the individual level. Hence their choices on continued education are well-informed choices." (p. 108).

To sum up, despite the different methodologies and underlying research questions, the literature indicates that the evidence on the ability of students to make accurate earnings expectations is mixed. Some of the studies have granted support to this notion, while others have found students to be overoptimistic about earnings (whether starting or future earnings). The present study involves a secondary objective of exploring to what extent students' expectations deviate from current wage rates. Of particular interest for it are the results reported by Carvajal et al (2000) and Wolter (2000) on whether students build their earnings expectations on the prevalent wage rates.

5.2.3 Evidence on the earnings expectations variables

As actual earnings in labour markets have been found in sizeable number of studies to be heterogeneous with respect to individuals, genders, and family backgrounds, research

on earnings expectations has analogously examined whether the same factors mediate differences in earnings expectations. Of course, the economic logic in terms of HCT and SSH suggests a major role for education and ability in differentiating earnings, and, equally, earnings expectations. Williams & Gordon (1981), as discussed above, supported empirically the centrality of intended education levels in deriving earnings expectations, which were influenced to a lesser extent by student ability, and which accordingly favoured the assumptions of HCT. Webbink & Hartog (2004) also found that types of HE affected the expected and realised earnings by signs and sizes that were remarkably very close. However, marks in secondary education for science students were found to influence the expected earnings but were not found to translate into realised earnings as their effect was insignificant four years later. After employing regression analysis, Varga (2002) found that the intention to apply for HE proved to be a significant explanatory variable in the absolute value of earnings. Recently, Rouse (2004) relying on data gathered from focus groups and an American national longitudinal study, showed that all participants reported positive net return to postsecondary education[4]. Looking at the differences in earning expectations between those who planned to attend college and those who did not, Rouse found that higher net returns to education were associated with college continuation decisions. The study also found that a significant portion of those who reported that they would expect to have higher and positive net returns to education, themselves expected to continue in college, and later did actually attend college.

However, equally, the latter four studies and many of the other studies analysed in the previous two sub-sections showed that other antecedent variables (primarily family background and gender) were associated with earnings expectations. Having regressed

earnings expectations on a set of variables, it was clear that females expected to earn less than their male counterparts. It is important here to mention some special results with respect to gender pay discrimination. In Betts (1996), while gender differences, in favour of males in earnings expectations held true for employment with only high school education, regression results indicated insignificant gender differences in the case of employment with college degrees. Blau & Ferber (1991) documented interesting evidence relating to gender, where females' expected starting earnings did not deviate significantly from those anticipated by male students. This changed with respect to future earnings (ten-year ahead), where gender gap in favour of males significantly prevailed.

Similar to the role of gender, different family factors (notably, mother's and father's level of education) have proved to be significant in some earnings expectations work, when controlling for other variables. However, some studies have offered contrary evidence. Smith & Powell (1990) unexpectedly found that "students whose fathers had a relatively low educational level expected comparatively high incomes from their own investment in college" (p. 194). Family background, or social class, as measured by father's occupation, exerted little influence on the anticipated earning functions constructed by Williams & Gordon (1981). Family income had an insignificant influence in the analysis carried out by Rouse (2004), who came to the conclusion that low-income students appeared to have similar earning expectations to those perceived by higher-income students. Similarly, Wolter & Zbinden (2002) reported that socio-economic variables had little effect on the discrepancies between expected earnings and those prevailing in the Swiss labour market.

5.3 Variables in student demand for HE

As mentioned in the introduction to this chapter, despite the growing awareness of the importance of the use of ERRs and earning expectations in examining individual education decisions, the work applying them remains surprisingly limited. Some of the studies of earnings expectations and ERRs reviewed in section 5.2 have further engaged in estimations of the influence of ERRs and earnings expectations, together with other intervening variables, on student demand for HE.

Besides the above-mentioned new emerging approach to handling student demand for education/HE, which is based on subjective earnings expectations, two other popular approaches have been more intensively applied using realised data. Both of these characteristically use various types of realised data, whether cross-sectionally or over time, but differ in which assumptions are made about the way student demand for HE responds to earnings. The first approach, which dominates the work in this area, often involves testing the causal relationship between changes in demand or enrolment decisions, and variables such as costs or the price of education (fees), individual characteristics, and socio-economic background free of any explicit assumptions related to earnings, sometimes even without using earnings as an explanatory variable (Lenton, 2005; Albert Verdu, 2000).

In contrast, the other approach may control for other intervening variables but also makes assumptions about the process used by students in building their earnings expectations, and how such a process influences demand for HE. According to Varga (2002), there are primarily two schools of thought with respect to assumptions about earnings expectations formation when earnings realisations are used instead. The first

assumes that individuals base their expectations entirely on current labour market earnings (e.g. Freeman, 1976; Lauer, 2002; Black et al, 2005). Freeman (1976), for instance, assumed that the number of engineering graduates in the current year was driven by the actual current starting salaries prevailing four years earlier. This implies that, based on this approach, current demand for engineering is determined by the current wage rates. The second school, on the contrary, models current demand as depending on the wage rates present after graduation. This assumption means that secondary students have rational expectations of future earnings and forecast future earnings accurately, constrained, however, by the accuracy and availability of information. Willis & Rosen (1979) and Modesto (2003) are examples of studies from this second school of thought.

In general, the approach using subjective earnings expectations has started recently to receive more attention and tends to be favoured from the theoretical point of view. However, attention should be drawn to the fact that the studies adopting this approach, including the current thesis, rely entirely on subjective expectations not only with respect to earnings but also with respect to post-secondary decisions. Therefore, some studies refer to this approach as examining the relationship between expected earnings or ERRs and post-secondary plans (e.g. Menon, 1997a).

Collectively, the literature pertaining to student demand for HE using the above- stated three approaches is voluminous, and therefore it would be impossible to comprehensively review it all. Therefore, this section will focus on the evidence produced by earnings expectations and ERRs studies. Nevertheless, as the number of

the studies using the latter approach is so small, the section refers to the general literature on demand for HE where this is deemed to be beneficial.

The rest of the current section is divided into two major sub-sections. Sub-Section 5.3.1 deals with the evidence on the influence of earnings expectations and ERRs on students' HE decisions. It also tackles three variables connected to the incidence of education benefits and costs, and in effect ERRs. They have received some attention in the literature of earnings expectations and have been examined more intensively in several studies within the overall literature on demand for HE. These are the effect of unemployment and labour market conditions; degree of urbanisation and distance from HE institutions; and the influence of consumption motives.

In the subsequent section 5.3.2, as many of the variables suggested and investigated in the literature are interrelated and vary in importance; they will be discussed under three main headings in (family income-related, parental attainment and student ability variables).

5.3.1 The influence of ERRs and related variables

All the studies reviewed in section 5.2 have in various ways documented that, on average, students do perceive the link between better education and higher earnings. However, only a few studies in the literature have directly tested the hypothesis of education endogeneity to ERRs and earnings expectations (Dhesi, 2001; Hung et al, 2000; Menon, 1997a; Varga, 2002). Overwhelmingly, the latter studies, apart from Dhesi (2001), have found that students' plans/decisions to opt for HE education are strongly and significantly influenced by the returns perceived or expected by them at

secondary education level, even after controlling for family background and personal variables. This initially suggests the importance and relevance of rate of return analysis for policy making and forecasting demand for HE. From the theoretical point of view, such evidence grants strong support to the economic interpretation of demand for HE, and particularly to HCT assumptions. After controlling for other variables (ability, gender, area of residence, socio-economic status, secondary education specialisation), Menon (1997a) observed this in her logistic regression results using both ERRs measured by the short-cut and elaborate methods. Consequently, her overall findings were supportive of human capital theory assumptions and showed that students behaved consistently with its predictions. Similarly, the hypothesis that ERRs influence post-secondary education decisions was strongly supported by the data gathered by Hung et al (2000) in China. It was evident in this study that secondary students behaved in accordance with the expectations of HCT, as it was found that short-cut ERRs, after controlling for gender, ability, and background factors, significantly affected the intention of students to continue into HE. The study applied logistic regression where students' most likely decisions on post-secondary stage represented the dependent variable regressed on ERRs and the other variables. Dhesi (2001) used the same data applied in Dhesi (2002). Unlike other studies in this section, which applied logistic models, Dhesi relied on a number of non-parametric measures of statistical association to examine the determinants of earnings expectations and the latter's effect on post-secondary choice. Regarding those factors influencing post-secondary choices, unlike the role of marriage prospects, the study found that the association between earnings expectations and post-secondary choice was not significant and neither was the effect of the measure of social prestige associated with HE. Alongside investigating earnings expectations, the study of Varga (2002), further employed earning expectations (the net

present value of expected additional lifetime earnings with HE) as one of the determinants of HE application decisions. The study applied a logit model and included other independent variables representing student ability (represented by the cumulative scores of students), family background (represented by per capita family income, parental attainment and home residence), and labour market employment expectations with and without HE, as well as gender. The study found that labour market return expectations impacted partially on the probability of students in the final year to apply for HE. The study's results, on the other hand, showed a significant role of the mother's level of education. School distance from a student residence was also proved to have a significant effect, suggesting regional inequalities in the probability to apply for HE. Students' expectations about employment with and without HE, on the other hand, had no significant effect on the educational decisions of the sample.

5.3.1.1 The effect of unemployment and labour market conditions

Based on economic theory, youth unemployment among secondary education holders, which reflects the demand for labour/labour discrimination, may positively manipulate the individual probability to demand HE (over time, across regions and countries, and across gender and ethnic groups and minorities), primarily through lowering the opportunity costs of enrolling in HE. In the studies mentioned above in this sub-section, only Dhesi (2001) and Varga (2002) measured, though in different ways, the influence of labour market conditions. As mentioned above, both studies revealed that career prospects and employment expectations proved insignificant in determining post-secondary stage education choices.

However, turning to the overall literature on demand for HE, the empirical evidence on the role of changes in unemployment rates varies across studies and between countries. For example, UK studies (e.g. Leslie & Drinkwater, 1999; Leslie et al, 2002; Micklewright et al, 1990; Pissarides, 1982; Rice, 1987) found a positive effect of the rate of unemployment in the determination of the enrolment rate/enrolment decisions, especially for minorities and ethnic groups, into post-compulsory education. Similar findings are reported in Betts & McFarland (1995); Corman (1983); and Mattila (1982) for USA, Albert Verdu (2000) and Fernandez & Shioji (2001) for Spain. Betts and McFarland (1995) found that full-time education demand was positively sensitive to unemployment rates, although the effect of unemployment becomes negative when it comes to part-time education demand.

In comparison, Berger & Kostal (2002) for the USA, Lo´pez-Valca´rcel & Quintana (1998) for Spain showed that unemployment was not influential in HE education enrolment decisions. Frederiksson (1997) found a very small impact of unemployment in Sweden, which was lower than the role played by wages in explaining the demand for HE. Likewise, using data from the Netherlands, Canton & De Jong (2005) reported a weak and insignificant impact of unemployment on demand for HE, which was found to be influenced more by changes in wage premiums, implying support for the notion that education can be considered as an investment individually.

5.3.1.2 The effects of degree of urbanisation and distance form HE institutions

In a related vein, changes in HE institutional proximity or distance, and the degree of urbanisation of the student's area of residence could potentially constrain HE enrolment for rural students or those living away from university campuses. This might be

translated via higher transport and time costs encountered by such individuals. However, once again, the influence of transport time and costs may be obstructed by the earnings expectations perceived by students from urban and other areas. For instance, if the labour market in rural areas is characterised by high unemployment among secondary education holders, this in effect may translate into lower opportunity costs in terms of expected foregone earnings, leading to a higher probability to enrol in HE. Studies of earnings expectations controlled for students' area of residence in the analysis of post-school decisions, (Dhesi, 2001; Menon, 1997a; Varga, 2002) have found some effects of such a dimension in educational plans in India, Cyprus and Hungary. Other support, in general, is available in the literature on demand for HE and educational attainment (Beblo & Lauer, 2004; Connelly & Zheng, 2003; Cormack & Osborne, 1997; Long, 2004; Ordovensky, 1995; Sa´ et al, 2004).

The influence of area of residence may also reflect differences in schooling services and resources that have a long-term influence on academic achievement, and thus an effect on the HE enrolment of non-urban students (Kane & Spizman, 1994; Le & Miller, 2005)[5]. In Jordan, for instance, it has been argued that schools within the nomadic and rural areas are disadvantaged compared with urban schools, leading to lower levels of academic achievement (see Chapter Three). However, this aspect has not been systematically explored, given the recent rapid reforms adopted by the education system and the many suggestions that such differences have disappeared. The current HE system involves assigning a quota for secondary students graduating from disadvantaged schools; most of these lie in the nomadic and rural areas.

5.3.1.3 The effect of consumption motives

As mentioned in Chapter Four, the classical economic view dictates that the demand for education is mainly consumption-based. However, such a belief lost credibility after the emergence of HCT. Empirically, consumption benefits/motives of education have been found difficult to quantify, consequently leading to little work on them (see Chapter Four). The ignorance of such motives may lead to underestimating the return to education and a flawed understanding of demand behaviour. Within the earnings expectations and ERRs literature, only two studies have considered directly measuring the effect of consumption benefits on student demand for HE. Dhesi (2001) incorporated some other cultural variables which can be considered as non-monetary or consumption benefits/motives of education, specifically expectations of change in social prestige and marriage prospects. The association between expectations of social prestige was insignificant, unlike the expectations of marriage prospects, which proved to be a significant factor. Also, Menon (1997b) used qualitative data gathered from the sample used in Menon (1997a) to investigate the effect of different economic and non-economic variables on demand for HE in Cyprus. Applying Likert-scaled statements, the study found that consumption motives are strong and have a powerful potential impact on student demand. In the current thesis, a very similar approach to that employed by Menon is used to examine consumption and other economic factors relating to work and education and their influence on student demand for HE in Jordan (see Chapter Seven).

5.3.2 Influence of family-background and personal related variables

5.3.2.1 Family-income-related variables

In economic analysis, resources available to economic agents are theorised to positively affect demand functions for normal goods and services. Similarly, demand for education is expected theoretically, other things remaining constant, to change positively with increases in household income[6]. Hence, lower family income is expected to be an essential factor constraining students' educational decisions on investment in human capital[7]. This was evident in two out of three ERRs studies reviewed above, specifically in Dhesi (2001) and Menon (1997a). Students from low-income families were found to be less likely to opt for HE in India and Cyprus, having controlled for other variables including ability and ERRs. Varga (2002), on the other hand, found family income to be insignificant variable in determining post-secondary enrolment decisions in Hungary. The overall literature on demand for HE provides a more detailed picture of the role of income. The rest of this section is concerned with such evidence.

Empirical studies utilising realised data have found that income has a positive influence on student demand for HE, with more impact for those from lower income families (Becker, 1990; Lauer, 2003; Lo´pez-Valca´rcel & Quintana, 1998; Rouse, 1994; Shim, 1990; Venti & Wise, 1983), besides its influence on the type of institution demanded by students (McPherson & Shapiro, 1998; Toutkoushian, 2001). Concern has also been raised about the ability of students from low-income families to persist in HE until graduation. The latter issue has received some attention, particularly in the US literature (e.g. Singell Jr., 2004). This study provided evidence on the positive link between the probability to persist and being from higher income backgrounds. In Jordan, the study of Bani Essa (1995) asked a sample of rural secondary students in Irbid governorate on

whether they intended to continue into HE, and regressed this variable, as a proxy for demand for HE, on a group of socio-economic variables. It was found that family income, besides student achievement and parents' education, was a strong influential factor in determining demand for HE. Al-Qudsi (2003) addressed general schooling enrolment behaviour in a group of Arab countries, and also found household income to exert a significant influence on schooling enrolment and student retention in schools. The study further corroborated the role of parental attainment in shaping Arab school enrolment. This study included data from Jordan, however it dates back to 1987, since which time rapid changes in Jordan's education system and labour market have occurred.

There are myriad ways in which family income may influence educational outcomes. One of the issues commonly arising in the literature is the interaction among income, tuition fees, and the availability of financial aid for students, and the imperfections of financial markets in providing student loans. As pointed out by Kane (1994), in the presence of loan market imperfection, implying borrowing constraints, and the presence of tuition fees in HE, a simple model of human capital theory would predict that students from low-income families would be less able to guarantee a source of funds than their counterparts from higher-income families. With the absence of certain student support schemes or guaranteed loans, the higher the family income and wealth, the better accessibility of students to loans from the capital market[8] (see, e.g. Acemoglu & Pischke, 2001; Dustmann, 2004; Linsenmeier et al, 2006; Mayer, 1997; Rice, 1987). Therefore, one major concern of policymakers is that students from lower-income families may be more restricted than other students in their choice of postsecondary education as a result of their lower ability to defray the costs of attending HE.

Investigating the role of income helps policy makers in formulating suitable policies to broaden participation, bridging the gap in attainment between students from different income groups. Al-Qudsi (2003) indicated that most for-education borrowing of Arab households was conducted outside of the formal financial system, relying in this regard more on relatives and the employers of breadwinners. Therefore, he recommended enhancing the role of formal credit accessibility and affordability to the poor-family students in order to increase enrolment rates.

Also, the decision to participate in HE is empirically often controlled for gender, as for example has been done in some of the studies of earning expectations reviewed above, which found a mixed influence of gender on the probability to enrol in HE. While Menon (1997a) reported that females were significantly more likely to demand HE, Varga (2002) indicated a higher significant probability for males, and Hung et al (2000) found no significant impact of gender.

In addition to culture-specific factors, from an economic point of view family income (or budget constraints) and return to education might jointly influence the probability of a child/female within a household to receive more family support to continue in more education. If the budget constraint is not binding, which means that parents have no obstacles to financing their children's education, and gender-based pay and hiring discrimination does not exist, family size or sibling sex composition will have no effect on the household's human capital investment decisions. In reality, budget constraint is binding, as capital markets are imperfect and many parents are unable to finance all their children's education after secondary school. Therefore the household's decisions on its children's further education will be expected to be subject to economic

considerations, where sibling sex composition and family size may exert a substantial influence. In this case, as pointed out by Bauer & Gang, 2001:

> Household resources are allocated to those children with the highest rate of return to human capital investments. This makes the education of each child in the family dependent on the size and composition of its siblings. Additional siblings lower the available resources per child. If, for example, the rate of return to education is higher for men than for women, boys will receive a greater share of the household available for investment in education and will therefore have higher levels of educational attainment than females. Theory further predicts that when the return to education is higher for men than for women, a girl with only sisters will receive more education than a girl with brothers and that a boy with only brothers will receive less education than a boy with at least one sister (p. 239).

Some studies (e.g. Averett & Burton, 1996; Hagy & Staniec, 2002; Nguyen & Taylor, 2003) have utilised family size, as approximated by the number of siblings, as an explanatory variable in directly affecting HE attendance decisions. These studies report that such a factor is inversely associated with the probability of enrolling in college education.

Other work (Bauer & Gang, 2001; Butcher & Case, 1994; Hauser & Kuo 1998; Kaestner, 1997) has also focused further on the role of sibling sex composition, besides sibling size, in competing for education resources within the household. The latter studies have produced complex results. In the USA, Butcher & Case (1994) found that sibling sex composition negatively influenced female educational attainment, while such variables proved not at all insignificant in the studies of Hauser & Kue (1998) and Kaestner (1997), which used different sets of data. However, the latter study found positive effect for black teenagers raised with a sister as opposed to their counterparts growing up without a sister, whereas the former found that only the number of siblings had a significant effect on children's educational attainment, regardless of sex. Bauer & Gang (2001) generally found neither sibling composition nor sibling number to be

influential in determining educational attainment in Germany. Bauer & Gang interpreted this finding on theoretical grounds predicting that the effect of sibling composition or size is expected to become less important when educational costs are smaller, as in Germany compared with the USA (which means a slighter budget constraint).

5.3.2.2 Parental attainment

The role of parents' income in constraining education attainment and decisions implies indirect effects of the level of education of parents, based on the assumption of a link between parental education and parental earnings (Behrman & Rosenzweig, 2002; Plug & Vijverberg, 2003)[9]. However, parental education probably plays a role separate from, and maybe even more influential than income through the mechanism of passing more and higher quality skills to their children particularly in the stages earlier than when students are about to make decisions concerning remaining in education (Aekvik et al, 2005; Beblo & Lauer, 2004).

Empirically, there is consensus in the literature that one of the most important predictors of educational decisions and overall educational enrolments of youths is the educational attainment of their parents (Haveman & Wolfe, 1995; Lo´pez-Valca´rcel & Quintana, 1998). Within those studies utilising earning expectations to explore enrolment decisions to HE, Varga (2002) documented a positive impact of mother's education on the probability to opt for further education after the secondary education.

In Jordan, in his cross-sectional analysis of demand for HE, Bani Essa (1995) granted mild support to the role of the parents' level of education. Similarly, Al-Qudsi (2003) found that the role of parents' education was corroborated by his data on schooling enrolment in a group of Arab countries, including Jordan. Kane (1994) studied college enrolment trends among black 18-19-year old school graduates in the USA during the 1970s and 1980s, using time-series and cross-sectional data collected for both black and white students from low-income and high-income families. He found that one-third of the downward trend in the enrolment of blacks in HE institutions in the 1970s and 1980s was attributable to increases in tuition fees. However, he emphasized the upward pressure on enrolment exerted by family background factors, represented by dramatic increases in the average parental education of black students. For blacks, he found that students whose parents were both college graduates had twice the probability of entering HE as those students whose parents dropped out from high school. In Germany, Lauer (2002) showed that social background factors (mother's education, father's education, father's occupation), coincidentally with returns and costs, influenced students' HE enrolment probability. Children of more highly educated parents, according to the latter German experience, are more likely to enrol in HE. Lauer (2003) provided a brief discussion of the French and German literature and pointed out that family background is a factor in determining education attainment and choices in both countries. Further, Lauer used data for the two countries and found the impact of family background on attainments and on post-secondary education significant. Evidence on the role of family background as proxied by parental education is available also in Aakvik et al (2005); Behrman & Taubman (1989); Edwards & Pasquale (2003); Ermisch & Francesconi (2001); Feinsteinn & Symons (1999); Le & Miller (2005); Mare (1980); Micklewright (1989).

Although the norm in the economic literature has been to apply income and parental education to approximate for family background effects on education attainment and decisions, parental occupation status has been used to proxy for social class more in the non-economic literature. However, this variable has also been applied in several economic empirical studies (e.g. Bradley & Taylor, 2004; Machin & Vignoles, 2004; Micklewright, 1989; Rice, 1999). In general, it has been found that those with parents having professional occupations are more likely to enrol than students born to unskilled parents. However, data on parental occupation has been used to proxy for family income in the absence of reliable income data (Nguyen & Taylor, 2003). Therefore, controlling for family income and education variables can to a great extent reflect the role of parental occupation.

5.3.2.3 Student ability

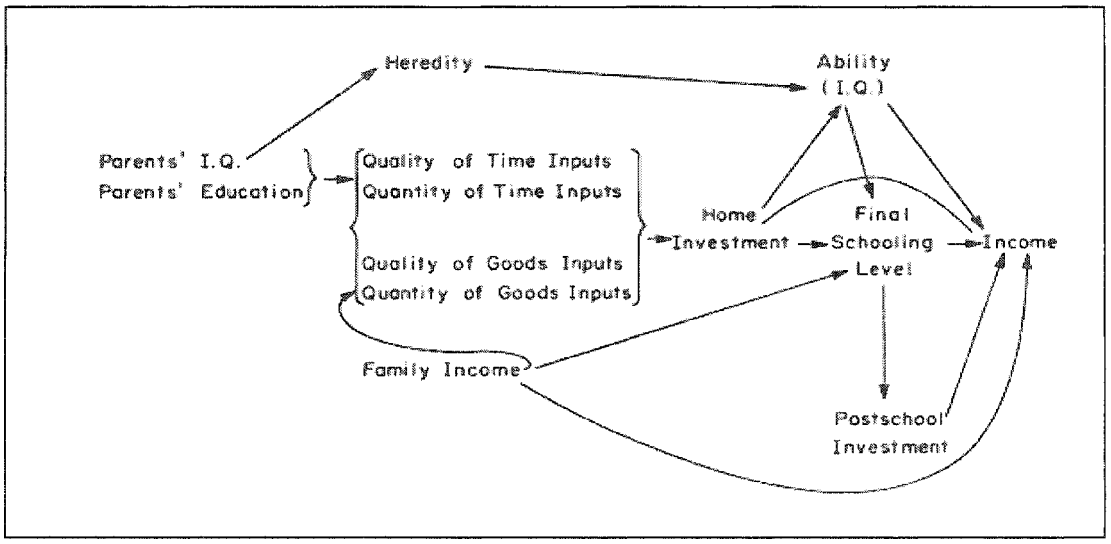
As observed in the previous sub-sections, the variables influencing student demand for HE are interrelated. Student ability tends not to be an exception. While such a variable is theorised to be amongst the prime exogenous variables affecting the probability of continuing into HE, as well as earnings, it is complexly endogenous to many other variables, such as family background and family income. Despite HCT suggesting that abler individuals are more capable of reaping the benefits from graduating with HE degrees (Nguyen & Taylor, 2003), the direction of influence of ability is theoretically not clear-cut (see Chapter Four). However, empirically, the norm has been to control for ability, implying a positive role for such a factor, which has been overwhelmingly evident in the literature.

Based on the economic literature, individual ability includes two types of internal resources; inherited exogenous endowment (inherited capital) and endogenous long-run cumulatively-built human capital (Zax & Rees, 2002). The former is assumed partially to be transmitted inter-generationally, from parents to children, whereas the latter is augmented through investment in human capital and is dependent on parents' investment in children's abilities, especially in the early stages, and on public investments. The interactions between family background, ability, schooling and earnings are better represented using the traditional framework suggested by Leibowitz (1974), as in Figure 5.1.

Simply put, according to Leibowitz's framework, family income is determined mainly by parents' education and ability, as measured by IQ, and it influences the resources available for children to undertake education. Children's ability, which influences their schooling and income, is augmented partially through genetic endowments transmitted from parents, indirectly by parents' education, ability, and income via higher quantities and quality of time and goods inputs (which both represent the household investment in human capital). Better educated parents, according to this economic model, tend to have higher earnings, and a lower number of children. Thus, as they are more able, better educated parents are expected to provide better quality and quantity of goods (such as food and health) for their children. Human capital embedded in children, which influences children's ability, is determined by the quantity and quality of the time invested by parents. Due to their higher ability and lower family size, educated parents may be more efficient in allocating more of their time available among their children as well. However, school variables which reflect public investment in education also

interact in influencing in the production of differentiated individual abilities (see below).

Figure 5.1: An economic model of the interaction among family background, ability, schooling and income



Source: *Leibowitz (1974)*

In the vast majority of research on the role of ability, or of factors influencing student ability, it is the norm to use measures of academic achievement (e.g. cross section/longitudinal test scores or cross section/longitudinal scores on scientific topics) to proxy for student ability. One should distinguish here between the literature on the variables affecting ability (academic achievement) and the literature on the extent of the role of ability in individual decisions on education. However, the two areas of research are mutually related and in some cases cannot be separated, especially with respect to public policy-motivated research. Student ability, as most often typically measured by academic achievement, has been found to be subject to enormous variables and complex variations, not only within a household, but within schools as well. Economically, with the widespread and growing theoretical and empirical belief that individual success and competitiveness, and collective success and competitiveness, are strongly linked to

human capital investment, particularly education; therefore economists increasingly find it imperative to explore the driving forces behind educational achievement, not only empirically but by the attempt to establish economic theoretical interpretations and causal effects, (Ashenfelter et al, 1999). Also, economists in the field of education have increasingly paid attention to the process of building ability and fostering it through public intervention. Numerous economic studies have generated empirical evidence in support of the role of ability in determining educational achievement, years of schooling and HE continuation decisions. Many of the enormous number of variables that have been empirically considered in influencing students' ability, or their academic achievement, are similar to those mediating differences in HE enrolments. Actually, it can also be argued that ability variables indirectly influence the probability of continuing into HE, since ability reflects the long-term influence of variables like family background and inherited ability. The number of studies conducted in the past on students' educational achievement is vast[10]. Webbink (2005) presents a comprehensive and up-to-date review of the causal effects of diverse variables on academic achievement. An earlier seminal literature review is provided by Haveman & Wolfe (1995). In addition to parental education and income, family size, sibling sex composition, gender, ethnic origin, birth order, and within-school variables have been found to participate in influencing academic achievement. School variables cover the influence of teachers, the curriculum, peers, class size, school type, school size and location. Jarwan (2001) investigated personal and family factors distinguishing between high and low achievers (upper 10% and lower 10%) of the eighth grade Jordanian students who participated in the Third International Mathematics and Science Study-Repeated (TIMSS-R). The study was education-based and found that in addition to variables relating to self-confidence, parental attainment turned out to significantly

influence students' achievements in mathematics and science. Further, other variables influenced directly by family income were found important (such as learning resources available at students' houses). A general indication of this study was that urban students outperformed their counterparts in the non-urban regions negligibly.

Overall, with respect to the role of ability as an exogenous variable of determining HE enrolment, a strong positive relationship has been found in the available literature (Clark, et al, 2005). Those studies associating ERRs and earnings expectations with the decision to enrol in HE (Dhesi, 2001; Menon, 1997a; Hung et al, 2000; Varga, 2002 see section 5.3.1) have reported a sizeable positive influence of academic achievement. Also, the literature pertaining to demand for HE and enrolment decisions contains many studies supporting this evidence. For instance, the study conducted by the labour economists Plug & Vijverberg (2003), who looked at the link between students' ability, their education, and parents' ability and education, concluded that ability does have a significant impact on attainment, and that the latter is partially affected by family income, parents' education and the within-household environment in which a child has been nurtured. Also, the study found that parental ability, through genetic transmission effects on children's ability as measured by IQ tests, is influential in explaining children's school success and, in effect the probability of undertaking more education. More able men, in terms of IQ, mathematics ability and reading ability, do academically significantly better than less able counterpart men from the same age cohort in the case of Britain, as reported by Dearden (1999). In addition to the latter factor, the type of school attended, parental education, and familial financial situation were also found to significantly determine educational outcomes in Britain. More recent studies on demand for HE control for student ability, and have documented a strong positive impact,

sometimes even greater than any other variable. Lenton (2005) found that variables measuring attainment in the final year of the compulsory schooling stage had the largest effect on the choice of first destination after the latter stage. Further evidence is also available in Christensen et al (1975); Borus & Capenter (1984); Rouse (1994); Averett & Burton (1996); Hilmer (2001); Nguyen & Taylor 2003.

With respect to demand for HE in Jordan, this is also positively determined by students' achievements (measured as average marks) as reported by Bani Essa (1995, see above), jointly with other socio-economic variables, namely income and parents' education.

5.4 Conclusion

Economists have long been intensely interested in understanding and using actual earnings in measuring rates of return to education. Also, the factors determining student demand for higher education (HE) have received ample attention from economists. Conversely, empirical work on students' subjective earnings expectations and their influence on post-secondary education decisions remain comparatively rare, despite the theoretical importance of such questions. Earning expectations held while on the verge of making educational and occupational decisions lie at the heart of economic theory as mainly represented by human capital theory.

This chapter has reviewed existing studies of students' earnings expectations and provides insights into the variables impacting on student demand for HE. Although they have been motivated by different underlying research questions, studies relating to students' earnings expectations primarily produced findings on three major areas: 1.

calculating/estimating ERRs and using them in exploring student HE enrolment decisions or plans; 2. examining the realism and accuracy of earnings expectations; and 3. investigating variables that mediate discrepancies in earnings expectations. In general, the evidence on the latter two aspects is inconclusive. While some studies found that students are capable of making realistic or accurate earnings expectations, others indicated that students tend to be overoptimistic regarding their future earnings. Two studies showed that students based their earnings expectations on the current prevailing wage rates, implying support for the use of Mincerian type rates of return (RORs) as proxy for ERRs primarily in understanding student demand for HE. Students turned out in most of the studies to perceive the link between education and earnings. However, the studies produced different levels of evidence for the effects of variables relating to family background, student ability, gender and area of residence on starting/future earnings expectations. Interestingly, in some studies, it was found that male students expected higher future earnings than females, whereas the gender differences tended to be lower regarding starting earnings.

Some studies have applied methods similar to those used to estimate/calculate RORs to education to construct ERRs based on students' earnings expectations. In addition to the Mincerian or earnings function estimation method, the elaborate and short-cut calculation methods were used as well. The ERRs measured were found in most of the studies to match well with RORs. A few studies have measured ERRs per student and further applied these in investigating student education decisions, producing strong evidence on the positive effect of ERRs on student demand fro HE. Also, various variables pertaining to student ability, parents' education, family income, areas of residence, family size or number of siblings have been shown to be amongst the prime

intervening variables in student demand for HE. Such evidence has not only been provided by earnings expectations studies but also by the broader literature pertaining to demand for HE.

[1]These rates are not adjusted for tax, as the respondents were asked to reveal their gross earnings. The authors also estimated tax-adjusted rates of return, which were of course lower than the above-mentioned rates, but still gave the same trends.

[2] Like some ERR studies, students surveyed by Smith & Powell (1990) were instructed to assume that there would be no inflation in the coming years.

[3] Overall, information on HE and the labour market is transmitted to students by a range of people and organisations, including: parents, peers and friends, tutors, teachers and career advisers, HE institutions, and also from governmental agencies. The economic theory assumes secondary students to be well-informed about post-secondary education and occupation decisions. Menon (2004) conducted a survey on a sample of HE students in Cyprus, to see the extent to which students had searched for information about HE prior to the enrolment stage. Her main conclusion in this regard was that "information search among students contemplating the choice of a HE institution is less than what we would expect under traditional economic theory" (p. 279).

[4] The anticipated returns to completing a bachelor's degree were simply measured by Rouse (2004) as the ratio of the expected income with a bachelor's degree to the expected income with a high school diploma. In turn, returns to college education were expressed in relative values rather than percentage increases. Students were found to perceive on average earnings for college education to be higher than twice those perceived for high school.

[5] However, school types themselves even within the same area, may, after controlling for family background and academic achievement, impact upon the probability to enrol in HE. For example, students attending private schools (e.g. Catholic schools) were found to be more likely to stay on after secondary education (Nguyen & Taylor, 2003).

[6] No matter whether education is considered as a consumption or an investment good. However, in the case of investment good, income plays a vital role only when individuals cannot borrow against their future returns from human capital. If households and individuals are able to borrow against future returns then only expected returns to human capital matter (Glewwe & Jacoby, 2004).

[7] It is thought that income has a stronger effect in developing countries (Zax & Rees, 2002).

[8] Banks will be reluctant to loan to students from lower-income families because of problems associated with default (Chapman & Ryan, 2005).

[9] One growing area of research in economics investigates the intergenerational mobility of earnings. Parental education is thought to be a main factor in the link between parents' and children's income.

[10] Miller et al (2001) present a review on the economic models of the study of educational attainment.

CHAPTER SIX
METHODOLOGY OF THE STUDY

6.1 Introduction

In Chapter One the objectives of this study were listed. This chapter is concerned with the methodology and methods applied in the study to achieve its objectives.

In section 6.2, the research philosophy and strategy are briefly discussed. The focus will be then on the research instrument of primary data (i.e. Self-completion student questionnaire) in section 6.3. It handles different aspects relating to the pilot studies, the structure of questionnaire and ethical considerations involved in the dissemination of the questionnaire. The procedures and method used in sampling and sample size determination are taken into account in section 6.4. Finally, section 6.5 is concerned with techniques used in the research as to the measurement of the expected rate of return (ERR) to HE and the modelling of the effect of ERRs and other explanatory variables on student demand for HE.

6.2 Research philosophy and strategy

As in most research in economic sciences, and in effect the process of development of knowledge in economics, the current research is undertaken under the umbrella of positivism[1]. Therefore, the study research strategy is based on applying quantitative methods through collecting primary and secondary data from the research elements and other sources. Secondary data were either collected from government departments, or calculated by the researcher based on government data. The primary data were collected

through a self-completion questionnaire distributed face-to-face to a sample of final-year secondary education students in Jordan (see the following section).

6.3 Self-completion student questionnaire

Questionnaires are the most frequently used method of collecting data. They are formulated as a written set of questions to which participants record their answers. All previous studies examining students' earnings expectations, ERRs, and their influence on students' decisions on education continuation (see Chapter Five), have adopted the self-completion questionnaire method. The use of a questionnaire in those studies, and in this study as well, is most attractive mainly because of the distinctive advantages of the questionnaire in cases where one needs large sample sizes and response rates of participants at the lowest possible time and resources costs. Compared with the postal questionnaire method, the face-to-face administration of questionnaires typically results in a higher response rate (Saunders et al, 2003; Bryman, 2001). This study adopted the face-to-face administration approach, where the researcher interacted with the respondents directly. Such a method produced a high response rate and better co-operation from participants and officials in schools (see section 6.4.2). However, the use of this approach required some ethical considerations to be taken into account while administering the survey (see section 6.3.3). Table 6.1 gives a description of the disadvantages and advantages of personally/self-administered questionnaires in comparison with the other two types of questionnaire (i.e. the mail and electronic questionnaires). Here, it should be noted that the researcher could not draw on the electronic questionnaire method mainly due to the unavailability of internet services/e-mail lists in the secondary schools surveyed.

Table 6.1: Questionnaire types, their advantages and disadvantages

Questionnaire type	Description	Advantages	Disadvantages
Self-administered questionnaire	Data collection method in which the researcher and the respondents meet face-to-face	Typically results in high response rate; requires fewer resources in terms of money and time; can establish rapport and motivate respondents and doubts facing respondents can be clarified.	Organisations may be opposed to using work time to complete the survey, particularly if the questionnaire requires a lot of people to participate. Organisations may also constrain the time allowed for the completion of the survey.
Mail questionnaire	Data collection method in which the respondent obtains the questionnaire through the post.	Usually associated with a high anonymity; can reach wide geographic areas and regions and enables respondents to take more time to respond at convenience.	Typically results in low response rates; arising questions and doubts cannot be clarified.
Electronic questionnaire	Data collection method in which the respondent obtains the questionnaire through the internet	Easy to administer; can cover wider areas even globally; very inexpensive; fast to deliver and respondents can answer at their convenience like the mail questionnaire.	Requires good computer literacy; requires all respondents to have access to internet.

6.3.1 Pilot test of the questionnaire

Two pilot studies were carried out to test the quality and practicability of the data instrument (the student questionnaire). They also aimed to ensure that all procedures followed were workable and manageable within the time allowed by the education officials for questionnaire completion, which was no more than 35 minutes for all the procedures involved in the process.

In the early stages of the research, an initial draft of the questionnaire was tested on a group of Jordanian students (15 students) from both Northumbria University and Newcastle University. This group of participants included 3 individuals undertaking research in areas related to education and having experience in teaching in public

schools in Jordan. As a result of the initial pilot study, it was found that the questionnaire was apparently too long and it would not be possible to capture answers on many questions within the limited time available. The researcher observed that the administration procedures of the questionnaire, which involved having written consent from the participants, plus the process of answering it took considerably longer than 55 minutes. This required the researcher to comprehensively review the questionnaire design with the aim of achieving a balance between the quality and quantity of data, taking into account that the questionnaire targeted school students. Therefore, a series of amendments were made as a result of the initial pilot study. The main amendment to the first draft of the questionnaire was to rely merely on starting earnings expectations to measure ERRs.

The second draft of the questionnaire was piloted in two secondary schools in AlKarak governorate. Twenty seven students (12 male and 15 females) from two final year-secondary education classes constituted the participants. The general conclusion of the second pilot study was that the questionnaire was relatively easy and quick to complete within the time allowed. During the second pilot study, it was perceived that students were able to understand and answer the questions. However, minor amendments to the questionnaire were also carefully conducted in the light of the second pilot study. Consequently, the final version of the student questionnaire was prepared and administered for the main data collection. Appendices 2 and 3 show the Arabic and English versions of the questionnaire respectively.

6.3.2 The structure of the questionnaire

The questionnaire in its final version consists of five parts containing different types of

questions on variables assumed to influence student demand for HE in Jordan and required to the measurement of ERRs. The first three parts were designed to be answered by all respondents irrespective of their post-secondary decisions. Those revealing, in part three, that they would most likely continue into HE (the demand group) were asked to answer part four and then submit the questionnaire. On the other hand, those who revealed instead that they would most likely search for employment after finishing secondary education (the employment group) were asked to skip part four and answer part five.

The first part asked the students to provide some personal and family background information. This included questions on gender, their average marks in the previous semester, academic branch, parental education and family income, and finally the number of siblings and number of siblings studying currently in HE.

The second part consisted of a group of scaled statements. A Likert scale similar to that developed by Menon (1997b) was adopted in this study. Likert scale is considered as one of most common methods to measure intensity of feelings and attitudes about the area in question (Bryman, 2005). It moreover gives respondents a wider choice of responses in answers to the questions (Pallant, 2005). This scale was used in the questionnaire design to facilitate eliciting students' opinions and positions, which are qualitative in nature, regarding some issues related to work and HE in Jordan. The format used to indicating level of applicability was a five-point scale where 5 = Fully applicable to me, 4= Applicable to a great extent, 3= Somewhat applicable, 2= Applicable to a small extent, 1= Not at all applicable.

In the third part, the students were asked to state their expectations on the post-secondary education stage. In order to proxy for student demand for HE, the students were asked to report their *most likely post-secondary decisions* (i.e. to continue into HE (demand group) or to seek employment (employment group)). This part represents the dependent variable in the logistic regression of student demand for HE. Part three of the questionnaire included a third option developed as an open question to deal with unexpected answers. However, it was not expected that there would be many to have options chosen other than the first two. Consistent with this expectation, as few as two females revealed that they wanted neither to continue in HE nor to seek employment, and instead they said they were going to get married and stay at home. The answers of those two students were excluded from the analysis of the ERR as well as the logistic estimation of student demand for HE.

Part four included two questions on starting earnings conditional on the respondent's employment with only secondary education, and conditional on employment with the degree he/she preferred to study. These questions were required for the measurement of ERRs (see section 6.5.1.1). Part five, as mentioned above, asked the employment group similar questions regarding earnings expectations as delivered to the demand group in part four.

The several questions forming the questionnaire collected data on important variables for the empirical analysis conducted in both Chapter Seven and Chapter Eight. It should be noted that the variables involved in the empirical analysis are different in their measurement types, since some of them are interval variables, while the majority are categorical variables. In Chapter Seven and Eight, the categories of these variables will

be shown in the reporting tables and figures.

6.3.3 Ethical considerations and administration procedures

Ethical considerations, as established by the University of Northumbria, were conformed to when conducting the questionnaire survey, which took place in the period from January until April 2004. Permission from the governmental branches in charge was obtained prior to the process of conducting the survey in the secondary schools. In this regard, the researcher initially asked for permission from the MOE, which provided the researcher with a covering letter used later to facilitate the fieldwork in AlKarak area. Also, prior written permission was obtained from each selected school's head-teacher. Appendix 6 includes copies of the letters of official permission and covering obtained by the researcher. This practice was one of the methods used to ensure maximum participation and co-operation from officials and students, as having a high response rate was very important to the success of the current research.

With respect to the questionnaire administration process in the schools, which took place face-to-face with respondents, the following practices were further applied to make sure that the ethical considerations were met:

1. Written consent from students themselves was obtained prior to the process of delivering the questionnaires (Appendix 4 shows a copy of the consent form). The signed letters of consent were filed separately from the students' answered questionnaires in order to assure respondent anonymity.
2. The process of the administration of consent forms and the questionnaires, took place with the supervision of at least one member of the administrative staff of each participating school.
3. Each copy of the questionnaire further contained a carefully-developed introduction.

4. The face-to-face method helped in getting more responses and was aimed also at the researcher being able to provide answers and explanations in response to questions from students as they arose.

The design of the questionnaire introduction and student consent was conducted carefully. They students were informed on the study aims and benefits, their rights and other aspects. These included:

Confidentiality: Students were not required to place their names anywhere on the questionnaire (i.e. the questionnaire was anonymous).

Contact information: the consent forms contained contact information on the principal researcher in the event that respondents and administrators would need further information or wished to ask questions.

Potential risk: students were informed that there were no potential risks associated with participation in this study.

Benefits and reasons: A brief explanation as to the reasons and benefits associated with completing the survey were stated as well.

Participation was voluntary: students were likewise informed that participation was voluntary.

Further use of the data: As the researcher wished to have the option to use the data for further studies, participants were explicitly asked for their permission on the consent

forms.

Time to complete the questionnaire: Students were also informed about the maximum time required to complete the questionnaire.

6.4 The sample determination

Commonly, the available time and resources for researchers exert substantial constraints on the way sample sizes are chosen to represent the populations under investigation (Bryman, 2001). In the current study, the researcher adopted an approach to selecting the sample size which was expected to give the best possible representation of final year secondary students in Jordan. Firstly, as it was impossible to survey all the schools in all the kingdom's governorates, AlKarak governorate was purposefully chosen for carrying out the fieldwork. This selection was thought to be the best as this governorate is located in the middle of the country and contains different degrees of urbanization that constitute all of Jordanian society regionally and culturally (i.e. urban, rural and nomadic areas)[2]. The HE institutions are distributed all over the country, so final year secondary students in AlKarak governorate can be to some extent considered as acceptable representatives of their counterparts in other parts of the country. Students in the middle of the country live at an average distance from all of HE institutions and so therefore they have average transportation costs for education. To sum up this point, the results of this study represent the situation in AlKarak governorate, but can, however, be to a great extent generalized for the whole country. The latter conclusion, besides the above reasons, is supported by the fact that the study involves a large sample size, which to a great extent can be considered as randomly chosen (see below).

The second step, following the selection of AlKarak, was to gather data on secondary schools in the governorate regarding the number of final-year secondary education students per area of residence (i.e. urban, rural, and nomadic areas). Using the random probability sampling method, a sample size for each area was determined (see next section). However, as no information was available about the sample units, the students themselves, the strategy was to draw on a random selection of a number of schools in each area that secured the pre-determined sample sizes of students per area.

The aggregate optimal sample size was abstractly measured to amount to 770 students (385 female and 385 males). However, the number of secondary students in each school in practice affected the actual sample size selected. The decision was to survey all the final-year secondary students of the randomly selected schools. The process of random selection was continued until at least the pre-determined sample sizes were obtained. For example, in the urban area, the optimal sample size was measured at 320 (including 160 females), but the actual sample size was greater by 22, as the final selected school was characterised by a large student body. Eventually, the actual sample size amounted to 817 students.

6.4.1 Formula adopted to determine the study sample size

There have been several similar formulae proposed for sample size determination, characterized by relatively complex mathematical considerations which are beyond the scope of this study. One general feature of the vast majority of those formulae is that they assume that some of the population characteristics, particularly the variance, are known (Tryfos, 1996; Scheaffer et al, 1996). Researchers may have prior knowledge on the population characteristics of interest based on previous research, for example.

However, this is virtually rare. Hence, statisticians have proposed various techniques to determine the appropriate sample sizes that do not necessarily require prior knowledge of population characteristics. One simple, famous and effective procedure, which was adopted in this study, is that appearing in equation 6.1 (Tryfos, 1996).

$$n = \frac{N\pi(1-\pi)}{(N-1)D^2 + \pi(1-\pi)} \qquad \text{Equation 6.1}$$

$$D = c / Z_{\alpha/2}$$

To determine the sample size (n), we need to know:

1. The population size (N),
2. A pre-assumed value of the sample (π), which represents the proportion of the units in the sample belonging to a particular sample category, y, (like those demanding HE). This lies between 0 and 1. The population proportion, P, of the units belonging to the population category, Y, is desired to lie within the intervals (π) ± c with particular significance level (such as α =0.05). $Z_{\alpha/2}$ is the critical value (on the standard normal distribution). The critical value $Z_{\alpha/2}$ when α =0.05 is equal to 1.96.

It is clear from the above formula that the researcher determines the degree of accuracy of the sample by considering the values of c and α. In the current study, based on the money and time that were available, the value of 0.05 for both α and c was chosen. However, with regard to the value assumed to represent (π), the value of 0.5 was preferred, which is a conservative value suggested by statisticians in case one does not know or is unable to hypothesize a particular value for it. The idea behind this formula is better understood by giving some details on the calculation of sample sizes carried

out in this study. As the researcher applied the same procedure, as in equation 6.1, to measure the sample sizes for the three areas (urban, rural and nomadic), the urban area may be used as an example. According to the above formula, the sample size that secured a confidence level of (α =0.05), for the urban area is as follows:

$$n = \frac{1919(0.5 \times 0.5)}{(1919-1)(0.05/1.96)^2 + (0.5 \times 0.50)} = 320 \text{ (rounded)}$$

(π) is assumed to be 0.5, which secures the largest sample size that secures the selected confidence level. If one chose a different value for (π) other than 0.5, let us say 0.4, the sample size would undoubtedly decrease (to 309). As a result, 0.5 is actually the most conservative value and choosing it in the above formula gives the largest sample size and places the research on the safe side. (π) in the current study could represent any variable that may differentiate among the population units (e.g. the expectations on the demand for HE). As we did not possesses prior knowledge on the proportion of students in AlKarak that would expect to continue into HE, the conservative value of 0.5 was selected (meaning that 50% of the population would expect to continue into HE). Table 6.2 provides information on the distribution of the students and schools in the population and the samples per area and gender.

Table 6.2: Distribution of final year secondary education students population and the measured sample sizes by area and gender

Area	Schools	Students	Male/Total	Sample (Males)	Sample schools*
Urban	33	1919	50.39%	320 (161)	6
Rural	27	818	49.26%	262 (131)	8
Nomadic	16	366	49.04%	188 (94)	7
Total	**76**	**3103**	**49.94%**	**770 (385)**	**21**

*School size differs according to the area. It is bigger in the urban areas

6.4.2 The distribution of participants and response rates

Broadly speaking, all the parties involved in this study, whether the MOE and its administrations in AlKarak, school staff, or the participants themselves, were very co-operative and realised the importance of the study. No respondent or school refused to participate. However, a number of students, especially males, did not participate due to their absence at the times of administration. Also, participation was influenced, however slightly, by the fact that some students had already made their decisions to leave to go to other schools other than those randomly selected, at the time of the survey.

Eventually, the response rate reached the following levels (see Table 6.3):

The response rate relative to the optimal sample size was 92% (708/770)

The response rate relative to the actual sample size was 87% (708/817)

Table 6.3: Distribution of the participants by gender and area

Area	Male	Female	Total
Urban	141	159	300
Rural	122	132	254
Nomadic	70	84	154
Total	**333**	**375**	**708**

6.5 The primary methods of data analysis

In general, the analysis of the data collected through the primary instrument and the secondary resources consists of two parts. In part one, the measurement and examination of ERRs and students' earnings expectations are carried out in Chapter Seven. Besides descriptive analysis and one-sample *t* test for means equality, this part applies the means of multiple regression techniques (Ordinary Least Squares). The second part of the analysis is carried out in Chapter Eight and concerned with the

student demand for HE. The next sub-section focuses attention on the underlying principles behind applying the short-cut method of measuring ERRs in this study. This also includes presenting a hypothetical example on the measurement of ERRs using this method. In the subsequent sub-section, the focus will be on a brief introduction to the logistic regression used in Chapter Eight.

6.5.1 The rationale for using short-cut method

Based on the literature (see Chapter Five), in addition to the estimation method, there have been two common empirical approaches to measuring ERR according to whether or not only starting earnings expectations are applied. The elaborate method was used based on constructing crude expected age-earnings profiles. On the other hand, the short-cut method, which is applied in this study, calculates ERRs relying merely on starting earnings expectations. As discussed in Chapter Five, The short-cut method is characterised by distinctive features; notably its simplicity and ease of use. The elaborate method, on the other hand, is more data demanding, as it requires the respondent to report not only their starting earnings expectations, as involved in the short cut method, but also their earnings expectations for many future time points (in an attempt to proxy for lifetime earnings profiles). The elaborate method is argued to give a better approximation of ERR as perceived by students themselves as it takes into account the potential convexity of age earnings profiles. However, the application of the elaborate method implies that students' earnings expectations would reflect the same shape as the actual profiles prevailing in the labour market. In effect, most of the work in this field has assumed that earnings would peak at a particular point (between the ages 40 and 50). Empirically, such a hypothesis has not been examined in the case of the labour market in Jordan, which is characterised by a big public sector in terms of

employment. This has led to characterising the labour market in Jordan and Arab countries, as suggested by Al-Sana'a & Wadee (2003), with high inflexibility in its pay structure and credentials tendencies. In such a case, starting earnings would to a great extent reflect the benefits of the pursuit of HE. Bearing this in mind, and that the short-cut method is less data- and time-demanding than the elaborate method, it was realised that the short-cut method's requirements would help in making the questionnaire as short as possible and would help in achieving the main objectives of the study at the lowest expenses in terms primarily of the time available for the questionnaire completion process (see the above discussion on the pilot studies).

6.5.1.1 Earnings expectations questions and the measurement of ERRs

The questionnaire asked students about their gross starting earnings expectations conditional on getting employment with only secondary education and with HE (university and community college education). This was followed for three reasons. Firstly, it allowed ERRs based on the short-cut method to be compared reliably with those measured in the most recent Jordanian study (Talafeh, 2003), which used the Mincer method to measure actual rates of return based on gross monthly wages (see Chapter Four). Secondly, one objective of the current study is to examine whether students build their expectations according to current prevailing wages. Asking students about their gross earnings was expected to demonstrate the maximum wage a student expects. In turn, the process of comparing starting earnings expectations with wages actually paid in the public sector, data on which are only available in gross terms, would be unbiased.

Also, the approach adopted was different from the original approach developed by

Psacharopoulos & Sanyal (1981), and instead was similar to Hung et el (2000), which involved an extension of the former approach by further asking the students to speculate on the opportunity costs (foregone earnings). The method further uses actual data on HE costs. In practice, MOHE is accustomed to distributing information on HE fees to students and households through schools and post offices in the final year when they are about to make decisions on HE enrolments. Therefore, students' responses to the questionnaire questions on HE and HE preferred fields and institutions are used in measuring the term C in equation 6.3. Among the secondary data collected was information about the HE fees given by the MOHE (see Appendix 5). For those belonging to the employment group, it was assumed that they expected the average tuition fees of HE.

Finally, the possibility of students undertaking part-time employment while studying is ignored in this study, as has been in all the previous relevant studies as well. So, the measurements of opportunity costs incurred by undertaking HE might be upwardly biased in the previous studies. However, this limitation is arguably less important in the case of Jordan, where unemployment is relatively high, especially among youths, which means downward pressure on the opportunity costs of remaining in HE. To suggest on the possibility that unemployment has an effect on HE decisions, students' perceptions of the link between education and employment were tested using the Likert-scaled statements provided in the second part of the questionnaire.

To better understand the short-cut method used in the current research a hypothetical example is presented. Assume that a student (i) perceives the following earnings expectations on the two scenarios (i.e. employment with only secondary education and

with HE):

If employed with only secondary education (in Jordanian Dinar JD): 150

If employed with a HE degree: JD 220

The ERR to HE as perceived by student (*i*) is:

$$ERR = \frac{ES_2 - ES_1}{nES_1} \qquad \text{Equation 6.2}$$

where ES_2 and ES_1 represent expected starting earnings (multiplied by 12 to become annual) reported by the students conditional on employment with HE and secondary education respectively. n denotes the number of years typically spent in undergraduate education, which is on average 4 years in the case of Jordan.

$$ERR_i = \frac{(220*12) - (150*12)}{4.(150*12)} = 11.6\ \%$$

The same procedure was used to calculate ERRs for all participants in the study (an analysis and presentation of empirically measured ERRs are detailed in Chapter Seven). Measured ERRs were then applied in the logistic regression estimation of student demand for HE (see Chapter Eight).

The same method was applied to measure ERR, but adjusted according to the HE fees by adding the term C to the divisor (see appendix 5 for HE fees). Equation 6.2 becomes after adding the term C:

$$r = \frac{ES_2 - ES_1}{n*(ES_1 + C)} \qquad \text{Equation 6.3}$$

Starting earnings expectations for secondary education and HE are used further to compare earnings expectations with actual earnings. To do this, the starting earnings offered by the public sector for various education levels and types were applied. As mentioned in Chapter Two, the public sector is the biggest employer and labour demander in Jordan.

6.5.2 The application of logistic regression

The prime purpose of this study is to examine the potential influence of ERRs, which are measured based on the short-cut method (see the previous section), and the influence of other economic variables in predicting the demand for HE among two groups of secondary school students in Jordan: those expecting to demand HE versus those expecting to search for employment. These two groups are labelled throughout the thesis as the demand group and employment group respectively. Classifying students according to their decision group requires the application of a multivariate dependence technique that predicts a binary dependent variable (i.e. demand HE versus search for employment) based on a set of independent variables with different types of measurement (i.e. interval, ordinal and nominal), which constitute the variables suggested both by the literature and theory.

Two-group multiple discriminant analysis and binary logistic regression are the standard multivariate techniques typically applied in the case of estimating a dichotomous dependent variable such as in the current study. However, logistic regression is preferred by many researchers, for various reasons (see Hair et al, 1998; Hosmer & Lemeshow, 2000; among others). Most importantly, unlike discriminant analysis, logistic regression is not strict in meeting the assumptions of multivariate

normality and equal variance-covariance matrices across groups. Logistic regression is robust even when these assumptions are not met. Also, it uses a straightforward statistical test and has the ability to incorporate independent variables with different types of measurement (i.e. interval, ordinal and nominal).

Some researchers apply the linear probability model (that is using OLS) in detecting relationships involving binary dependent variables, but such use is now rare and is far from ideal. A binary dependent variable is not normally distributed as it takes two values and therefore the distribution function takes an S shape which is also non-linear, where the probability of the dependent variable is bound to be between 0 and 1. The application of OLS instead of logistic regression would in some cases also produce irrational values of probability (i.e. more than 1 or less than 0), leading to difficulties in interpretation. Therefore, based on the above-mentioned reasons, logistic regression was selected in this study.

According to Hutcheson & Sofroniou (1999), Hosmer & Lemeshow (2000) and Tabachnick & Fidell (2001), the relationship between a dichotomous dependent variable and a set of explanatory variables can be expressed non-linearly as in equation 6.4

$$p = \frac{e^{(B_0 + BiX_i)}}{1 + e^{(B_0 + BiX_i)}} \qquad \text{Equation 6.4}$$

where p is the probability of an event happening, B_0 is a constant, B_i are coefficients to be estimated and X_i are the explanatory variables (predictors of the probability of an event).

The dependent variable in Equation 6.4 is typically expressed as an odds ratio rather

than probability. An odds ratio is basically the ratio of the probability of an event happening over the probability of that event not happening. For example, if the probability of an event (e.g. winning the lottery) happening is 0.60, the odds ratio will be equal to 0.60/0.4, which is equal to 1.5. The odd of an event happening (see Hutcheson & Sofroniou, 1999) therefore is:

$$\frac{p}{1-p} = e^{(B_0+B_iX_i)} \qquad \text{Equation 6.5}$$

where p is the probability of an event happening and 1-p, in effect, is the probability of an event not happening.

However, the main problem of the relationship in equation 6.5 is that it is non-linear and requires a transformation such as logistic regression. Simply put, the idea behind logistic regression is to transform the relationship expressed in equation 6.5 into a linear one in order to render the estimation analogous to OLS. Thus, logistic transformation helps in making the process of interpretation much easier. Transforming the latter equation into logit one results in the following type of linear relationship:

$$\ln\left(\frac{p}{1-p}\right) = B_0 + \sum B_i X_i \qquad \text{Equation 6.6}$$

where the left-hand side of the equation is the log odds ratio. Analogously to analysis in OLS, the logistic regression produces coefficients (B_i) representing a change in the log odds (log odds ratios) when an explanatory variable changes by one unit. However, it is the odds ratio rather than log odds ratio that is required for statistical interpretation and prediction, especially if one is more interested in obtaining the influence of an explanatory variable on the probability of an event happening. Therefore, another

transformation by taking the inverse of the natural log of the log odds, is needed to make the coefficients much easier to interpret. Using software such as SPSS 12.0 such a process is inexpensive in terms of time.

The logistic regression output often produced by SPSS 12.0 provides one with both the log odds ratios and odds ratios. The value of odds ratios, unlike log odds ratios, cannot take negative values, where odds ratio of 1 means that no relationship exists between the two variables. A lower than one/greater than one value of the odds ratios indicates a negative relationship/positive relationship between an explanatory variable and the dependent variable.

6.5.2.1 Goodness-of-fit measures of logistic regression

Examining the goodness-of-fit of a particular logistic model involves assessments of the significance of the variables in the model and the performance and significance of the model as a whole.

Values of the statistic of the log likelihood (-2LL) are used to measure how well the model fits overall by indicating the deviation between the predicted values of the dependent variable using a particular model and the observed values of the dependent variable from the data. This measure is multiplied by -2 to create a statistic that is distributed as a chi-square distribution, with the number of degrees of freedom equal to the number of explanatory variables (Tabachnick & Fidell, 2001). The latter statistic is assumed to differentiate significantly, based on the chi-square distribution, when more significant variables are entered to the model. If an explanatory variable does not affect (-2LL) *significantly*, this in effect means a rejection of the hypothesis that an

explanatory variable influences the dependent variable and an acceptance of the null model. –2LL is a standard statistic in logistic regression and is usually presented jointly with one or more of the following statistics, which are concerned with measuring the overall goodness of fit of a model: the classification table method; the Hosmer and Lemeshow test; and R^2.

The classification table method simply measures the goodness-of-fit of the model by comparing predictions produced by that model with the observed outcomes. Typically, any case with a predicted probability of 0.5 or greater is classified as a member of the event happening group, and is therefore considered as having a value of 1. Similarly, those cases with a predicted value of less than 0.5 are classified as being from the other group (the not happening group) and assigned the value of 0. Collectively, the table shows in percentage form how many cases from each group are correctly predicted by the model. However, this method has the limitation that it does not give any weight to the difference between a predicted value and the cut-off value (typically 0.5). For example, assume that two logistic regressions (let them be called model 1 and model 2) were used to predict the value of a case, which was observed as 1 (i.e. from the event happening group). Assume that model 1 gave a prediction value of 0.55 to the case (with 0.45 error), while the other gave 0.95 (with 0.05 error). Using the classification table method, both models will appear to have the same predictive ability in spite of the fact that the second model was clearly better, since it produced a much closer prediction.

An alternative, or companion, to the classification table method, is that developed by Hosmer & Lemeshow (1989), which measures the fit of a model by showing how

closely the observed and predicted probabilities match (Norusis, 1999). Usually, this test indicates the ability of the model more precisely than a classification table, but it requires a larger sample size, as it involves dividing "the cases into 10 approximately equal groups based on the estimated probability of the effect occurring [in order to] see how the observed and expected number of events and non-events compare" (Norusis, 1999, p. 64). The significance of the Hosmer and Lemeshow test is calculated by applying a chi-square distribution with degrees of freedom equal to the number of groups minus 2 (typically equal to 8). If the chi-square value is significant (at a p value of 0.05 or less), then the null hypothesis can be rejected meaning that there is a significant difference between the observed and predicted values and implying a bad fit of the observed outcomes. In Chapter Nine, classification table and Hosmer and Lemeshow test results will be reported alongside the estimated logit models.

Another technique which is typically reported in the logistic SPSS output is the Pseudo R^2 measures. Norusis (1999) explains the use of R^2 in logistic regression:

> In the linear models, the R^2 statistic represents the proportion of variability in the dependent variable that can be explained by the independent variables. It is easily calculated and interpreted. For logistic regression models, an easily interpretable measure of the strength of the relationship between the dependent variable and the independent variables is not available, although a variety of measures have been proposed. (p. 77)

In general, empirical studies using logistic models are characterised with low values of R^2 (see Cramer, 2003; Hosmer & Lemeshow, 2000), especially with respect to cross-sectional data[3]. Consequently, researchers commonly report several different statistics, such as classification tables and Hosmer and Lemeshow tests, to precisely detect the predictive performance of the logistic regression estimations. In terms of binary logistic regression, SPSS 12.0 calculates two types of pseudo R^2 (i.e. the Cox and Snell, and

Nagelkerke types). The latter type is a development of the former, which cannot achieve a maximum value of 1 (Norusis, 1999). Only Nagelkerke R^2 will be reported alongside with the other statistics in the logistic regression analysis in this study (see Chapter Eight).

For the determination of the significance of B coefficients (odds ratios) in logistic regression, the most common procedure is the use of Wald statistics. This test is conducted by comparing the maximum likelihood estimate of the model coefficients, B_i, to an estimate of their standard error (Hosmer & Lemeshow, 2000). Specifically, the Wald test applies the standard value of logistic regression coefficients in identifying the significance of the coefficients and in effect the significance of the whole model (Tabachnick & Fidell, 2001). The critical chi-square value for the Wald test using 5% level of significance is 3.841. This means that a logistic coefficient is significant only if its chi-square Wald test value exceeds the latter value.

6.5.2.2 Data treatment and multicollinearity

Data collected from the questionnaire responses were numerically coded. Quantitative codes were assigned to each data item from the questionnaire responses to facilitate the use of logistic regression analysis and other techniques in investigating the data. A process of data filtering then followed, which was conducted to check for any case that was mistakenly coded or entered. The latter process was based mainly on checking the descriptive statistics of the variables, particularly the mean, maximum and minimum values, and frequencies. However, some data problems cannot be completely identified until after the analysis is initially carried out. The most important problem is that of *multicollinearity*.

The application of logistic regression, as well as the multiple OLS regression as in Chapter Seven, needs the analysis to be checked for the presence of multicollinearity among the explanatory variables. This problem can generally be defined as a situation when there are strong linear relationships between two or more of the explanatory variables. Multicollinearity among explanatory variables is a serious problem, since the inclusion of collinear predictors does not provide much extra predictive information beyond that already contained in the other variables. Consequently, it becomes difficult to infer the separate effect of such variables on the variation in the dependent variable (Greene, 2003). Various methods have been proposed for the purpose of assessing multicollinearity. A simple method is to examine pairwise measures of correlation (e.g. a univariate correlation matrix of the explanatory variables). A univariate correlation matrix, however, may not be sufficient, as it does not reveal the presence of dependencies among more than two variables. A more useful technique is to examine the variance inflation factor, VIF, which is defined as a relationship with R^2 as follows:

$$VIF_i = \frac{1}{1 - R_i^2} \qquad \text{Equation 6.7}$$

where R^2 here measures the dependency of one particular explanatory variable when it is regressed on the remaining explanatory variables (Hutcheson & Sofroniou, 1999). A related alternative method is to examine tolerance, which is the reciprocal of VIF. Of course, the greater the R^2 in the above specification, the greater the incidence of multicollinearity. In general, there is no specific rule on the cut-off degree of serious multicollinearity, except that one should be more conservative in terms of having a smaller number of explanatory variables. Econometricians have suggested some common rules of thumb on the critical value of VIF (5, 10, see e.g. Studenmund, 2006; Tabachnick & Fidell, 2001). In the current analysis, both in the OLS analysis in Chapter seven and the logistic regression in Chapter Eight, the conservative value of 5 was

adopted. Thus, if VIF is greater than 5, the multicollinearity is deemed serious. If severe or serious multicollinearity takes place, regression analysis should take account of it. In short, econometricians have proposed some different practical methods to deal with such a problem, varying from the simple suggestion of dropping some of the collinear variables to attempting to extract factors or components (by factor and component analyses) that can jointly represent collinear variables. Besides that, the collection of more data on missed variables and increasing the size of and degree of representation of a sample may help in relieving the influence of multicollinearity[4].

6.6 Conclusion

The focus of this chapter was to explain the methodology designed to fulfil the study's objectives listed in Chapter One. The chapter has shown that the study relies on primary data collected via a self-completion questionnaire administered face-to-face in a group of secondary schools in one of Jordan' governorates. Prior to and during the dissemination process several procedures were conducted to make sure that the questionnaire was in terms of time manageable and it met the necessary ethical considerations. In this regard, the questionnaire was piloted twice. In addition to written consents from students, permissions were further obtained from various official departments and schools involved in the fieldwork of the research.

With respect to the measurement of ERRs, the study adopted the short cut method (see Chapter Seven). Logistic regression was selected to examine the influence of earnings expectations, as implied in ERRs, and other variables on student demand for HE (see Chapter Eight).

In addition to the short-cut method and logistic regression techniques, the study applied several parametric and non-parametric quantitative methods. The next two chapters critically present the empirical findings of the study.

[1] Positivism applies deductive and inductive reasoning relying on quantitative data to arrive at a set of law-like generalisations that can be employed to forecast general systems of human activity. In the context of the positivism, the researcher is independent of the subject of the research and therefore his interpretations about the data are assumed to be objective. As opposed to Positivism, another two schools of thought about the way in which knowledge is developed and judged are presented in the literature, namely, Interpretivism and Realism/ Critical research. (Cavana et al., 2001; Saunders et al., 2003).

[2] However, one should note here that, to some extent, throughout the whole country such cultural differences have disappeared due to governmental efforts and the information revolution that has emerged over the last decade. However, economic inequality has been argued to have widened severely due to increases in poverty levels (see Chapter Two), and the IMF-supervised economic reform implemented by the country since 1989.

[3] Regarding cross-sectional studies, there is a general observation to have lower R^2 even when one uses OLS techniques (Gujarati, 2006).

[4] In case one has a relatively large number of explanatory variables, *Ridge Regression* method can also be applied to deal with multicollinearity. This method is a good technique for obtaining more stable parameter estimates in the case of logistic regression. For more details see Cessie & Van Houwelingen (1992).

CHAPTER SEVEN
EXPECTED EARNINGS AND
ERRs TO HE IN JORDAN: EMPIRICAL ANALYSIS

7.1 Introduction

The present chapter analyses the primary data on earning expectations gathered using the questionnaire survey. In addition to the short-cut method, the empirical analysis provided in this chapter applies a multi-faceted approach consisting primarily of descriptive analysis and multiple linear regression techniques. The analysis aims to look into differences in and patterns among students' expected starting earnings, and the variables underlying such differences. A specific general theme targeted in the current analysis is to examine whether education positively and evidently impacts on students' earning expectations. This will be achieved through estimating the variables influencing expectations and the measurement of short-cut expected rates of return (ERRs). Measured ERRs to HE will serve, moreover, as the prime explanatory variable in the logistic analysis of student demand for HE carried out in the next chapter. The analysis also involves empirically investigating whether students make their earnings expectations based on the current prevailing observed earnings. This is examined in a simple comparison between students' starting earnings expectations with the starting earnings in the public sector.

Table 7.1 describes the questions used in the survey to elicit students' expected starting earnings. It categorizes earnings expectations into four variables based on the group of students targeted (the demand and employment groups). In order to detect patterns in the opportunity costs of remaining in HE, all respondents of the both groups were asked to report their expected starting earnings with secondary

education only (variables 1ES and 2ES in Table 7.1). Similarly, the questionnaire elicited students' expected starting earnings on employment with HE (variables 1EH and 2EH in Table 7.1). Here, a slight difference in questions to the two groups should be highlighted. HE is more diverse than secondary education. Therefore, due to time constraints, it was rather difficult to ask those students expecting to enter the labour market immediately after secondary education (the employment group) to report on starting earnings for each HE type or field. It was realised that the best strategy was to obtain their average starting earnings expectations with HE irrespective of subject area. At the same time, those expecting to enrol into HE were asked to report their starting earnings if they were employed with their preferred HE specialisations, rather than on average. However, the use of this procedure assumed that, given an acceptable sample size, the students' responses would largely reflect the average expected starting earnings with HE.

In addition to expected starting earnings variables, the analysis in this chapter depends on many other variables, data for which was collected using the questionnaire. Most of these, except average of marks and number of siblings, are categorical variables representing family monthly income, parents' education, gender, area of residence, HE field, and sector preferred for employment. The tables of results displayed in this chapter body and annexed at its end provide insights on the categories of these variables, especially for the HE specialisations, data for which was collected from responses to an open question (number 21 in the questionnaire) and recoded into eight distinct filed groups using the data on actual earnings assigned by the public sector.

The chapter is divided into four main sections. Section 7.2 considers the role of education and other variables in determining students expected earnings. Section 7.3 provides empirical evidence on the difference between expected and actual starting earnings, as approximated by public earnings. In section 7.4, ERRs to HE and its filed groups are calculated using the short-cut method. The final section concludes the chapter.

Table 7.1: Description of expected starting earnings variables used in the empirical analysis of Chapter Seven

Variable	Target	Description (as asked in the questionnaire)
1ES: Expected Starting earnings for secondary education (continuous variable)	For those only reporting they were most likely going to search for employment after GSEC (employment group N=221)	As you report above that you are most likely not to continue into HE and will search for employment, how much money do you expect to earn monthly (gross starting salary) supposing you will have employment with only the GSEC? The gross starting salary I expect to earn monthly is JD..... per month
2ES:Expected Starting earnings for secondary education (continuous variable)	For those only reporting they were most likely continuing into HE (demand group N=487)	Suppose that you were not continuing into HE and would have employment only with the GSEC instead. How much money would you expect to earn on average monthly (gross starting salary)? The gross starting salary I expect to earn monthly is: JD.....per month
1EH: Expected Starting earnings for HE (continuous variable)	For those only reporting they were most likely continuing into HE (demand group N=487)	As you report above that you are most likely continuing into HE, how much money do you expect to earn monthly (gross starting salary) supposing that you will have employment with the HE field you most prefer? The gross starting salary I expect to earn monthly is JD..... per month
2EH: Expected Starting earnings for HE (continuous variable)	For those only reporting they were most likely going to search for employment after GSEC (employment group N=221)	Suppose that you were not terminating your education after the GSEC and would have employment with HE instead. How much money would you expect to earn on average monthly (gross starting salary)? The gross starting salary I expect to earn monthly is: JD.....per month

7.2 Expected starting earnings patterns and the role of education

The empirical analysis overwhelmingly supports the hypothesis that Jordan's secondary students do perceive a positive relationship between education and

earnings. This finding was evident through descriptive analysis and multiple regression estimations (using OLS) of the starting earnings expectations variables clarified in Table 7.1. The next sub-section shows the descriptive analysis, followed by the multiple regression analysis in sub-section 7.2.2. Sub-section 7.2.3 comments on the latter two sections.

7.2.1 Descriptive analysis

The descriptive analysis of the expected starting earnings carried out in this section contributes to understanding differences in expectations across gender, education level and area of residence, which are investigated more precisely using regression analysis in the next section. Further, it can be employed as a reference point for the subsequent empirical analysis comparing expected and actual earnings, and the calculation of ERRs.

7.2.1.1 Differences in earnings expectations across gender and area of residence

Figures 7.1 and 7.2 show average expected starting earnings by gender with secondary education (variables 1ES and 2ES in Table 7.1), and with HE (variables 1EH and 2EH); respectively. Male students on average expected to earn more than females by nearly 6.2% in the case of secondary education. This means that on average females tended to expect lower opportunity costs than males. Interestingly, however, this percentage dropped for HE to 3.4%, suggesting that females probably looked at obtaining more education as a method of decreasing the gap in earnings with males. The regression analysis in 7.2.2 will show whether these differences are significant.

Figure 7.1: Mean expected monthly starting earnings conditional on secondary education (foregone earnings) by sex

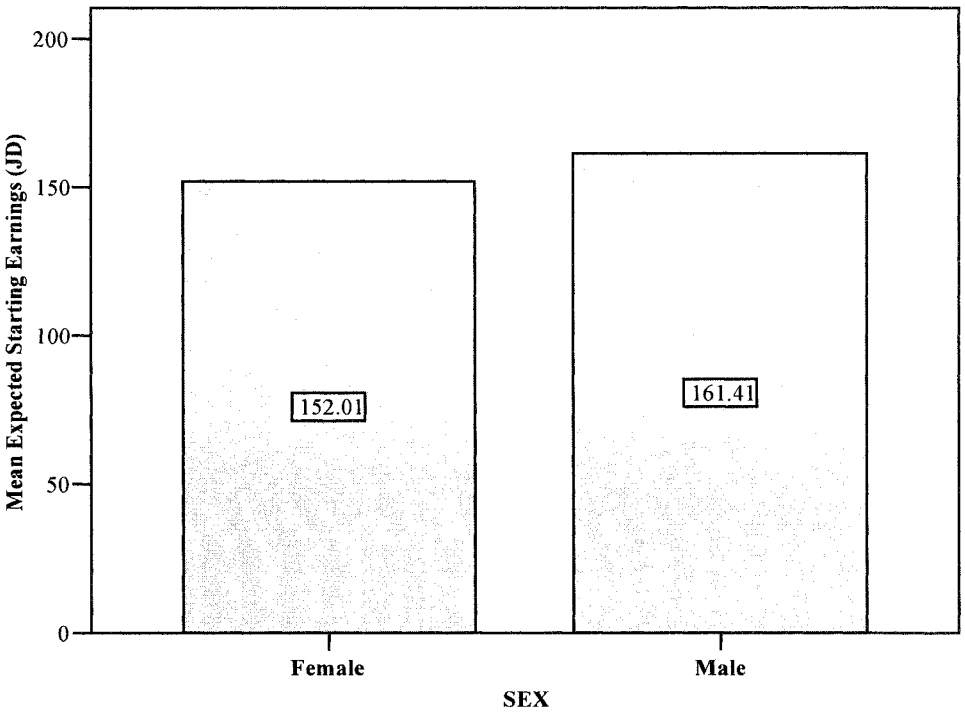
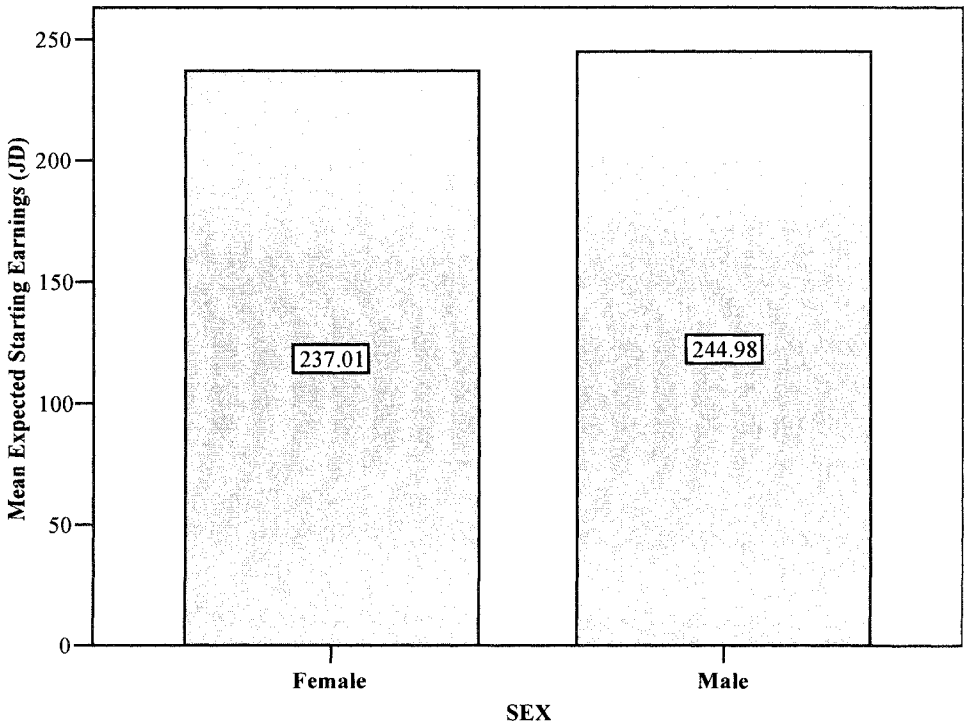


Figure 7.2: Mean expected monthly starting earnings conditional on HE by sex



Gender differences are maintained to a great extent across area of residence, as displayed in Figure 7.3 and 7.4, in particular for secondary education. Figure 7.3 shows that urban students, irrespective of sex, expected to earn more on average than their rural counterparts, who in turn expected more than students from the nomadic area. This suggests that students in urban areas perceived on average higher foregone earnings (the opportunity costs) for remaining in HE, possibly due to regional differences in labour market opportunities and earnings. Likewise, students in rural areas anticipated on average to earn more if employed with only secondary education than students in the nomadic area. From Figure 7.4, the gender gap in earning expectations was proved to exist, on average, in favour of males except in the nomadic area. However, the gender differences across area are lower for HE than is the case with secondary education.

Figure 7.3: Mean expected monthly starting earnings conditional on secondary education (foregone earnings) by sex and area

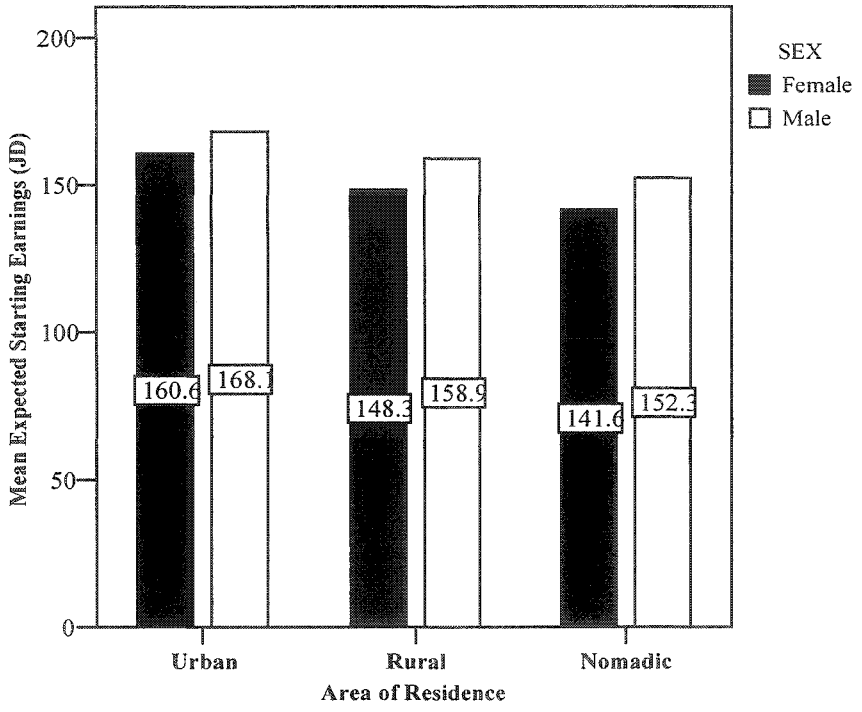
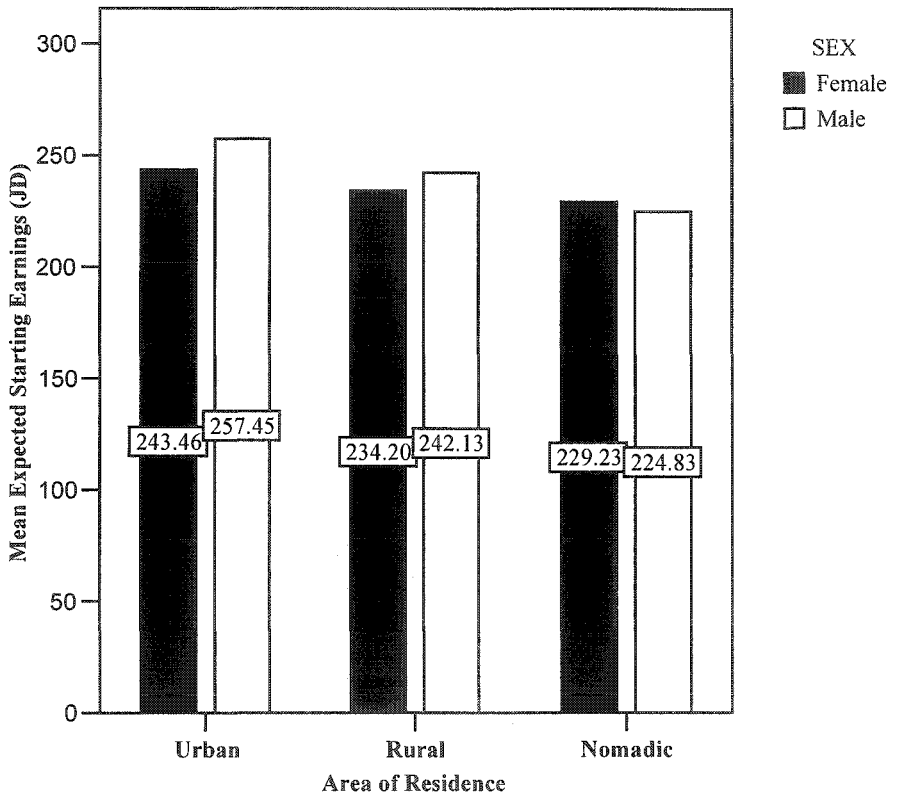


Figure 7.4: Mean expected monthly starting earnings conditional on HE by sex and area

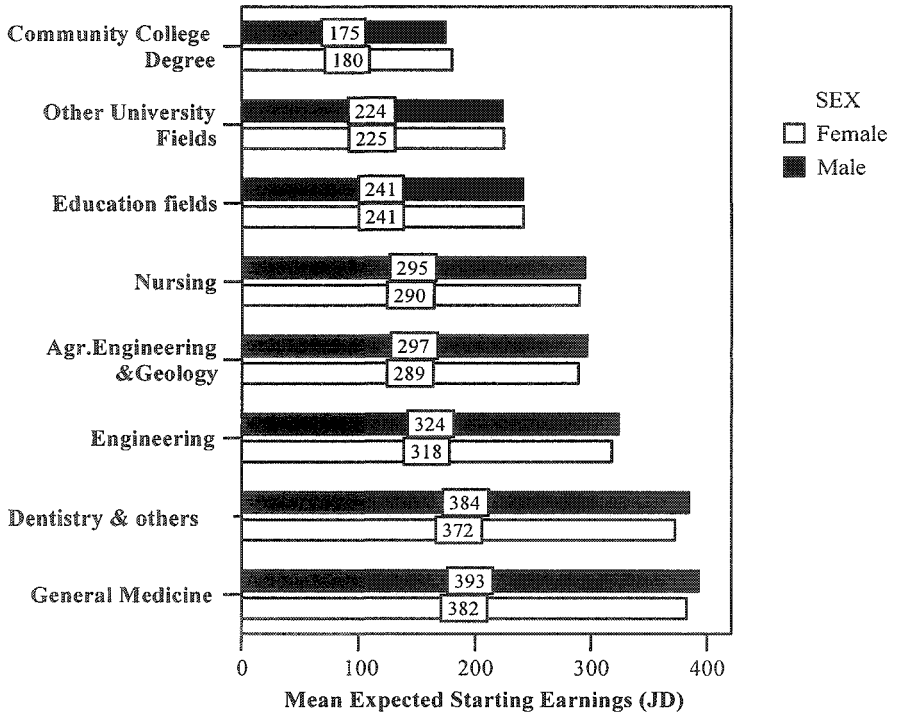


7.2.1.2 Differences in earnings expectations by HE fields and gender

Figure 7.5 displays expected starting earnings on average for HE field groups by sex. The data used in this figure were gathered using the question corresponding to variable 1EH in Table 7.1, which was answered merely by the demand group. Students' responses in this regard were grouped into eight distinct groups according to the public wage premiums paid for each HE specialisation (see section 7.3). As Figure 7.5 demonstrates, across the majority of the field groups, except for community college education, the gender pay gap was perceived in favour of males, but tended to be smaller. However, males and females turned out to predict similar starting earnings for education and other university fields. In terms of community college education, females expected to earn more than males by about 2.8%. The

latter findings are probably one of the driving forces behind the substantial difference between the sexes in demanding community college education (see Table 7.10 below). The percentage gender difference in expectations varies from as little as -0.5% for other university fields to the higher level of 3.2% for dentistry. These gender gaps are relatively low, and explain why the gender variable is insignificant in the regression results reported in Table 7.3b below. Regardless of a student's sex, the medical sciences were perceived to be the highest paying field group, where males and females expected on average to earn JD393 and JD382 per month respectively. On the other hand, the second top was dentistry, with averages of JD384 and JD372 for males and females respectively. These expectations patterns actually mirror actual starting earnings differences as represented by public sector earnings (see section 7.3).

Figure 7.5: Mean expected monthly starting earnings for HE field groups by sex



7.2.1.3 Average expected net gain

Theoretically, the difference between starting earnings perceived for secondary education and for HE represents the prime monetary benefits of education, and this is theorised to affect student demand for HE through ERRs. This difference is termed here the expected net gain of HE. Bringing the data in Figures 7.1 and 7.2 together shows that the expected net gain varies according to students' gender in favour of females, however slightly (JD 85 compared with JD 83.5; 1.7% higher). Although male students on average perceived that they could reap greater starting earnings on average from HE, such a perception did not compensate for the difference in opportunity costs (earnings with secondary education). Such an important conclusion might affect the probability of a female continuing into HE. However, this also depends on other important factors; notably, family income-related variables and student ability (see next chapter). Likewise, as easily observed from Figures 7.6 and 7.7, the average difference in earnings expectations between HE and secondary education is substantially positive irrespective of gender and area of residence. However, urban males appeared to have the highest expected net gain compared to all other groups of students.

Figure 7.6: Mean expected monthly starting earnings by education and area (for female students)

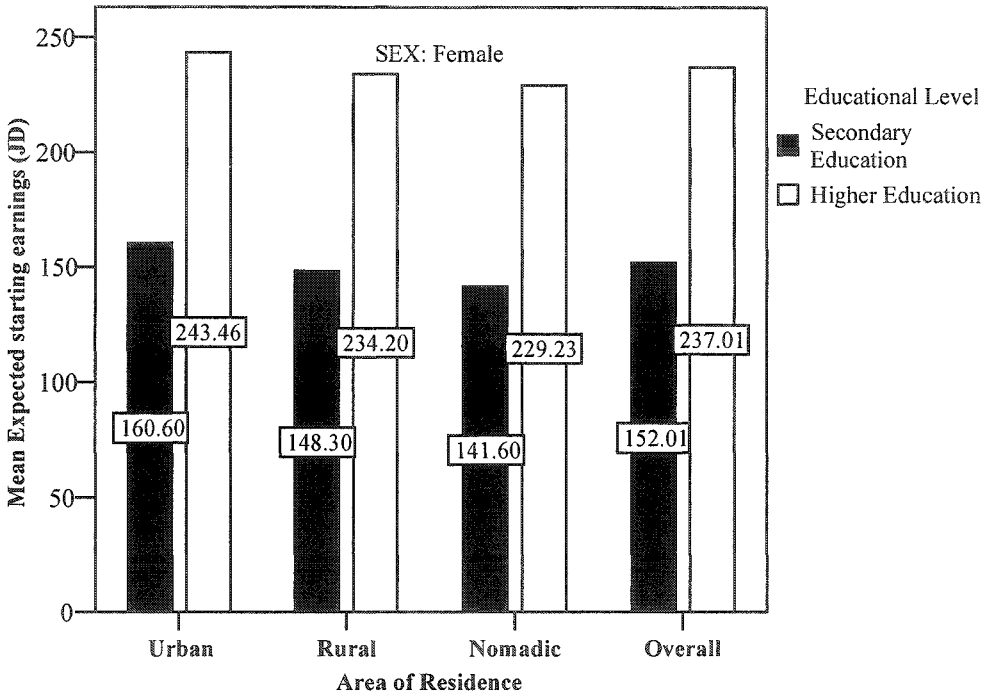
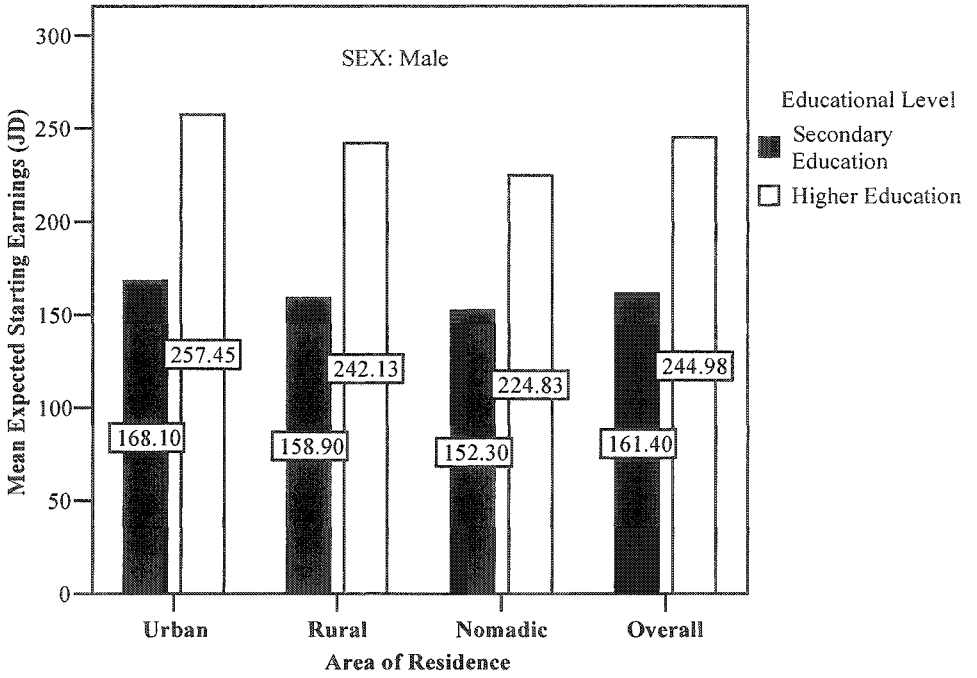


Figure 7.7: Mean expected monthly starting earnings by education and area (for male students)



7.2.2 Regression analysis

To more accurately detect the significance of the influence of education on expected earnings and the significance of gender and area differences in earnings expectations, trials of multiple linear regressions were carried out on the earnings expectations variables depicted in Table 7.1. First, the influence is detected directly through investigating the relationship between intended level of education (secondary or HE) and earnings expectations (variables 1ES and 1EH in Table 7.1). This analysis is shown in sub-section 7.2.2.1. Similarly, a regression analysis is carried out in 7.2.2.2 to examine the relationship between expected earnings and preferred HE fields. Finally, in sub-section 7.2.2.3 a supplementary regression analysis is performed aiming at exploring the variables influencing earnings expectations for both levels of education (i.e. secondary education and HE) separately.

7.2.2.1 Estimation of the influence of education on earnings expectations

To directly examine the effect of education on expected earnings in a multiple regression setting it was required to pool students' responses on expected starting earnings. The dependent variable consisted of expected starting earnings for every respondent conditional on her/his intended level of education (variables 1ES and 1EH in Table 7.1). The major hypothesis guiding this analysis was that those intending to continue into HE (the demand group) would expect on average higher starting earnings than those reporting a high likelihood to search for employment (the employment group).

Since the labour market in Jordan is characterised by a large public sector, one would expect that the influence of gender-based pay discrimination perceived by the

students would be slight, because the analysis is restricted to starting earnings. Yet, this is apparently contradicted by the above descriptive analysis, as well as by the economic theory itself. From an economic theoretical stand point, the incidence of discrimination characterising Jordan's labour market might indeed impact on gender choices towards occupations and, in effect, on starting earnings. Economic theory predicts that the labour market male-female gap would result from productivity differences, due to gender differences in human capital investment taking place parallel to experience (or age). Therefore, theory expects females to select those occupations characterised by high starting earnings, to reap the highest possible returns in the early period of employment. Women are more expected to have interruptions in later periods of employment, due to family or domestic responsibilities, especially in conservative cultures such as Arab countries, which may contribute to making men more likely to persist and obtain more on-the-job training and consequently higher wages. Blau & Ferber (1991, see Chapter Five) examined this possibility using American students' earnings expectations, and concluded that females did not expect higher earnings than males at the career entry level. Regarding future earnings, they found that expected earnings gap was noticeably in favour of males. Their findings were not in accordance with the above economic theoretical interpretation of the male-female income gap, suggesting that such an observation was not only determined by productivity differences. In sum, based on the theoretical background, the gender variable was also expected to influence the dependent variable.

Furthermore, assuming that students are well-informed on starting earnings, and that employers are completely ignorant of the personal characteristics of students[1], the

ability variable, as approximated by the average of marks for each respondent, was not considered to have a great theoretical importance at the level of starting earnings. However, average of marks might positively influence expected starting earnings for each education level separately (see sub-section 7.2.2.3). Employers, in this case, are assumed to use average of marks information to sort out employers having the same level of education into productivity groups.

Accordingly, only two variables were expected to influence the dependent variable on theoretical grounds; namely, students' post-secondary decision (to have only secondary education =employment group or continue into HE= demand group) and gender. Empirically, as mentioned in chapter five, other variables including family income and parental attainment might also intervene in differentiating students' earnings expectations, more notably future earnings. Therefore, as this is the first empirical study in terms of estimating earnings expectations in Jordan, stepwise multiple regression techniques were applied to explore the predictive variables exerting significant influences on students' starting earnings in case of Jordan.

The general econometric model guiding the analysis is based on the linear/linear form, which may be shown as:

$$Y_i = \beta_1 + \beta_j X_i + u_i \quad i = 1, 2, 3, \ldots, 708 \qquad \text{Equation 7.1}$$

In the econometric specification in Equation 7.1, Y is the expected starting earnings variable (1ES and 1EH); Xs are the explanatory variables defining students' post-secondary decision (employment group or demand group), gender and other

explanatory variables defining other characteristics of students such as (student academic ability, as represented by average marks, family monthly income, father's education, mother's education, preferred sector for employment, and area of residence). The intercept term is shown as B_1, while B_j are the coefficients to be estimated. Finally, u represents the error term.

Table 7.1a annexed at the end of this chapter reports the results of the current estimation when all the variables enforced into the model at once (the simultaneous model). After running the stepwise regression technique, however, only three regressors were proved to be significantly associated with the dependent variable (as shown in Table 7.2b)[2].

Table 7.2b: Results of the stepwise OLS estimation of the expected starting earnings (pooled for the sample, N=708)*

Variable**	Coefficient	t-statistics	*p* value
(Constant)	159.485	39.637	0.000
Sex (Female=0)	12.243	2.934	0.003
Post-secondary decision (0=Search for employment)	85.006	19.307	0.000
Family monthly income (less than 250=0) ≥JD 550	19.27	2.052	0.041
Model Summary statistics:			
R^2	0.362		
Adjusted R^2	0.359		
F-statistics	133.199		
p value (F-statistics)	0.000		

* Dependent variable represents responses on variables 1ES and 1EH Table 7.1. See Table 7.2a for simultaneous model. **The variance inflation factor (VIF) values for all independent variables were less than 3; indicating low multicollinearity.

As expected, the results in Table 7.2b show that the decision to opt for HE education determines very significantly the dependent variable. On average, a student deciding to opt for HE is predicted by this model to expect a monthly premium wage that is

higher by JD 85 (≈ US$ 120) than a student with similar characteristics deciding instead to enter the labour market immediately after secondary education. Contrary to the absolute economic theoretical predictions and consistently with the above descriptive analysis, female students expect to earn less at the career entry stage, irrespective of post-secondary stage decision (by around JD 12.245 monthly). As discussed in Chapter Five, family income and background variables may influence individual earning expectations. Realised earnings functions typically control for family influences and there is strong evidence of the persistence of the intergenerational transmission of income levels. However, this typically involves realised earning data at various employment stages, not only at the entry level. On the whole, family income and parents' education were not related to the dependent variable in this model, except for those students belonging to the highest income group, who are modelled to expect to obtain relatively higher earnings (by JD 19.270). The latter finding may indicate some sort of social-based pay discrimination. Alternatively, it might signify an intergenerational income mobility effect, as families with more wealthy backgrounds are more likely to have their own family businesses, leading to more employment opportunities and payment prospects for their children.

7.2.2.2 Estimation of the effect of preferred HE fields on earnings expectations

Another approach to econometrically detect to what extent education is associated with differences in earning expectations is to run an estimation of the variable (1EH in Table 7.1) on the preferred HE field groups and other variables. This is expected to provide further evidence, as it was observed in the above descriptive analysis that students on average were differentiated in their earnings expectations by HE field

group. Also, it was expected that the gender effect would be lower or even become insignificant, as Figure 7.5 showed low differences in terms of expected earnings for HE field groups. Table 7.3a, which is annexed at the end of this chapter, depicts the simultaneous model's findings for this regression model, while Table 7.3b demonstrates the results of the stepwise linear model.

Table 7.3b: Results of the stepwise OLS estimation of the expected starting earnings for HE field groups (sample N=487)*

Variable**	Coefficient	t-statistics	*p* value
(Constant)	399.500	69.771	0.000
HE preferred field (General medicine =0)			
Dentistry & others	-11.651	-1.694	0.091
Engineering	-70.962	-12.240	0.000
Nursing	-98.406	-14.716	0.000
Agr. Engineering &geology	-93.829	-12.594	0.000
Education fields	-155.091	-28.454	0.000
Other university fields	-170.375	-31.366	0.000
Community college	-214.754	-39.410	0.000
Sector preferred for employment (Private=0)	4.833	1.728	0.085
Area of residence (Urban=0)			
Rural	-14.316	-5.694	0.000
Nomadic	-20.789	-6.843	0.000
Sex (Female=0)	0.018	0.009	0.993
Model Summary statistics:			
R^2	0.884		
Adjusted R^2	0.881		
F-statistics	313.668		
p value (F-statistics)	0.000		

*Dependent variable represents responses on variables 1EH Table 7.1. See Table 7.3a for simultaneous model. **The variance inflation factor (VIF) values for all independent variables were less than 5.

Two main notable results stand out from Table 7.3b to support the effect of education on earnings expectations. Firstly, starting earnings expected for HE vary by field group. Coefficients corresponding to all the seven dummies representing the HE field groups, relative to the reference category (General medicine), are significantly

negative, with of course different magnitudes. This strongly supports the idea that earnings expectations vary according to education level and type as well. This result is of great importance to the analysis which follows in the next section on the comparability between what students expect and what actual rewards are currently offered in Jordan's labour market. Secondly, goodness-of-fit statistics in terms of adjusted R^2 soared to the very high level of 88% compared with 36% in Table 7.2b. This difference most likely resulted from the changes in both the dependent variable and the sample. However, it remains strong evidence of the link between education and expected earnings. As predicted based on the above descriptive analysis, the gender variable turned out to be insignificant in the current model as opposed to the model represented in Table 7.2b, which however used more data and encompassed a rather different dependent variable. The current model is restricted to measuring the effect of the explanatory variables in differentiating the dependent variable relative to the reference category, which is General medicine, unlike the case of the model in Table 7.2b, where the reference category was secondary education. This obviously means that the influence of gender tends to disappear among earnings expectations for HE fields. Actually, this also possibly reflects the higher preferences for public sector occupations where gender pay discrimination is less problematic in general and non-existent at the entry level. Gender differences apparently remain a significant phenomenon on average, however, as indicated in the previous sub-section (see also the next sub-section).

7.2.2.3 Estimation of earnings expectations per educational level

Similar estimation procurers were applied for examining the whole sample's responses of expected starting earnings separately for secondary education and HE,

respectively (variables (1ES and 2ES) and (1EH and 2EH)). The findings of these two models are reported in the simultaneous regressions in Tables 7.4a and 7.5b annexed at the end of this chapter and in Tables 7.4b and 7.5b shown below, which report the stepwise regressions. It is worth noting here that in these models it was impossible to include a measure of education decision, since the analysis deals with responses for each education level separately. Also as mentioned above, theoretically, employers may use marks to classify employees bearing the same education level into different groups of productivity, which can help in recruitment policies and wage determination. However, the theory implies that students are well-informed about such phenomenon.

Briefly, the findings in Tables 7.4b and 7.5b support most of the results of the above analysis conducted in the previous two sub-sections. The evidence produced in these two models suggests that the gender variable is significant. Furthermore, both models produced indirect or implied supportive evidence to the role of education, as R^2 lowered substantially. In particular this is very clear from Table 7.5b, which shows that the ability of variables other than education to explain earnings expectations is economically insignificant, despite the statistical significance of the associated R^2 value of 0.041. The results indicate that the role of ability variable (average of marks) is inconsistent. In the case of secondary education, as in Table 7.4b, this variable is significant, however at more than the level of 0.05. Surprisingly, the model indicates that the relationship is negative, which is against the theoretical economic expectations. The fact that students are not well-informed about earnings and recruitment policies might confuse the role of earnings in this situation. Alternatively, employers themselves might not employ average of marks as a sorting

out device, taking into account the role of the state in the labour market in Jordan. In terms of Table 7.5b, despite the significance of the ability variable and the fact that it is consistent with the theory, the whole model's ability of predicting the dependent variable is very low, in terms of R^2 as indicated above.

Table 7.4b: Results of the stepwise OLS estimation of the expected starting earnings for secondary education (sample N=708)

Variable*	Coefficient	t-statistics	*p* value
(Constant)	175.386	24.753	0.000
Sex (Female=0)	9.216	4.848	0.000
Area of residence (Urban=0)			
Rural	-11.752	-5.510	0.000
Nomadic	-16.853	-6.743	0.000
Average of marks	-0.163	-1.860	0.063
Family monthly income (Less than 250=0)			
≥JD 300 ≤ JD 349	-12.175	-4.220	0.000
≥JD 400 ≤ JD 449	-6.461	-1.756	0.080
Father's education (Illiterate=0)			
Elementary	5.851	1.877	0.061
Secondary	4.399	2.064	0.039
Sector preferred for employment (Private=0)	4.289	1.884	0.060
Model Summary statistics:			
R^2	0.142		
Adjusted R^2	0.131		
F-statistics	12.874		
p value (F-statistics)	0.000		

* Dependent variable represents responses on variables 1ES and 2ES Table 7.1. See Table 7.4a for simultaneous model. *The variance inflation factor (VIF) values for all independent variables were less than 2.

Table 7.5b: Results of the stepwise OLS estimation of the expected starting earnings for HE (sample N=708)

Variable*	Coefficient	t-statistics	*p* value
(Constant)	189.808	10.550	0.000
Sex (Female=0)	10.779	2.162	0.031
Area of residence (Urban=0)			
Nomadic	-17.225	-2.885	0.004
Average of marks	0.787	3.442	0.001
Family monthly income (Less than 250=0)			
≥JD 400 ≤ JD 449	17.423	1.810	0.071
Sector preferred for employment (Private=0)	-12.031	-2.019	0.044
Model Summary statistics:			
R^2	0.041		
Adjusted R^2	0.034		
F-statistics	6.027		
p value (F-statistics)	0.000		

* Dependent variable represents responses on variables 1EH and 2EH Table 7.1. See Table 7.5a for simultaneous model. *The variance inflation factor (VIF) values for all independent variables were less than 2.

7.2.3 Expected starting earnings and education: some comments

To sum up, both the descriptive and regression analyses have enormously confirmed empirically that secondary students in Jordan expect or perceive a substantial positive impact of education on earnings.

Other variables jointly appeared to contribute to influencing starting earnings expectations, but inconsistently and not so strongly as education. It seems that gender to some extent is involved in predicting earnings expectations, except in the case where the regression was based on the responses of the demand group and controlled for HE field groups. Gender-based pay discrimination in Jordan's labour market, (Miles, 2002), might be a possible explanation of these gander differences in starting earning expectations. The fact that females in Jordan expect lower starting earnings possibly hinders female labour market participation, which is relatively low (see

Chapter Two). Also, on the other hand, such perceptions among female students result in lowering the opportunity costs to the pursuit of HE, which in turn could have contributed to increasing female HE participation over the last two decades. Taking into account the role of Jordan's public sector in the employment market, where females are assigned similar starting wages, this could result as well from some degree of lack of knowledge of actual earnings and mirror students' general perceptions on female-male pay gap.

Contrary to the role of gender, the student ability variable was found to be weakly associated with the dependent variable in three out of the four above-shown estimated models. The fact that ability is a weak variable in these models should not, however, be interpreted as indisputable support for HCT. The opposite conclusion would be correct also, given the role of the state sector, since Table 7.3b showed a strong impact of HE field groups, suggesting some potential influence for the sheepskin hypothesis. As noted in Chapter Four, using only starting earnings expectations (and, actually, even using lifetime earning expectations) would not reflect clearly the actual behaviour of earnings in the labour market. This further requires the examination of actual earnings, through which the actual behaviour of employers may be more reliably and directly inspected. The degree to which students are well-informed on the earnings/relative earnings prevailing in the labour market, and the way they are determined, may influence the heterogeneity of starting earnings expectations, and may in turn lead to distortion of the actual impact education exerts.

An overall consideration of the estimated models shows also that non-urban students, particularly those from nomadic areas and in particular for HE field groups, are predicted to significantly expect lower starting earnings. These significant differences will translate into the net gains perceived for HE, and consequently ERRs.

Finally, the coefficients of the education variables in both models (Tables 7.2b and 7.3b) reflect monetary returns to HE education. However, in line with the literature of earnings functions, which are used to measure RORs as in Equation 4.1, Chapter Four, ERRs can be also estimated directly, applying semi-logarithmic forms, where expected starting earnings transformed into log form and regressed on untransformed explanatory variables (mainly education and gender). This is carried out and reported in Appendix 7. The results reported in the appendix show similar findings to those reported above. Education and gender appeared to be the main determinants of starting earnings expectations. Also, with respect to the estimated ERR, estimated ERRs tend to match moderately well, particularly on average, with those measured using the short-cut method (see section 7.4). For example, Table A.1 in Appendix 7 indicates that the average ERR (coefficient of education, which is significant beyond the 0.01 level) is around 17%. In Table 7.9, the ERR averages around 14.3 %, which is comparable with the later estimated rate, given the differences between the two methods of ERRs. Short-cut method is a calculation method, not an estimation one, that cannot take into account the role of other variables. On the other hand, the estimation method measures the average rate and does not control for subjective individual perceptions of opportunity costs. This latter fact might contribute to the difference between the two methods with respect to ERRs perceived by females. In

Table A.1, male students were found to expect greater ERRs than females, unlike the results reported below using the short-cut method.

As mentioned in the introduction and the methodology chapters, ERRs at the individual/group level in this research will be measured based on the short-cut method (see section 7.4). So, the estimated models in this section and in Appendix 7 provide merely concrete evidence on the notion that students on average perceive the link between education and higher earnings. Therefore, the estimated coefficients are not used in the current study to measure rates of return per se. This is simply due to the fact that the models do not reflect subjective individual perceptions or expectations on the net gain for HE and consequently on the opportunity costs of student time. Put differently, the short-cut method is expected to provide more reliable individual ERRs, which are required for the logistic regression in the next chapter, as it takes account of each student's earnings expectations for HE and secondary education simultaneously.

7.3 Expected starting earnings vs. actual public starting earnings

This section explores the extent of the deviation of earnings expectations reported by the students from the actual earnings that prevail in Jordan's labour market. This will initially suggest whether students rely on current prevailing wage rates in building their earnings expectations. Also, such an investigation will further suggest some insights into the validity of using RORs and realised cross-sectional earnings data in forecasting demand for HE as proxy for ERRs. Furthermore, the analysis aims to identify to what extent students accurately perceive the structure of earnings and relative earnings.

However, the analysis is only generally indicative and suggestive, as it draws completely on starting earnings and only those for the public sector. Public employees are assigned different gross starting wage rates based on the educational levels and types obtained. Other individual characteristics may be important, specifically previous experience, marital status and number of children, which all typically result in slight differences in starting earnings. Such differences are ignored in this study, since the analysis is concerned with young people aged between 17-18 years, who usually have no previous labour market experience and are not married. The majority of newcomers to the public sector are waged according to the Civil Service System (CSS). It is important to mention that some autonomous public sector bodies, such as public universities, which typically represent a small proportion of public employees, govern their own earnings structures. Nevertheless, it is believed that the public sector starting earnings give a reasonable picture of the actual starting earnings in the whole economy, taking into account the fact that the private sector is relatively weak and its earnings to some extent mirror those of the public sector. The public sector is also the biggest employer in the country (see Chapter Two), and is typically more preferred by labour suppliers in Jordan. In the current study, the public sector was the preferred employment sector for a substantial fraction of the students participating in the questionnaire survey[3] (see questions 25 part four and 22 part five in the questionnaire).

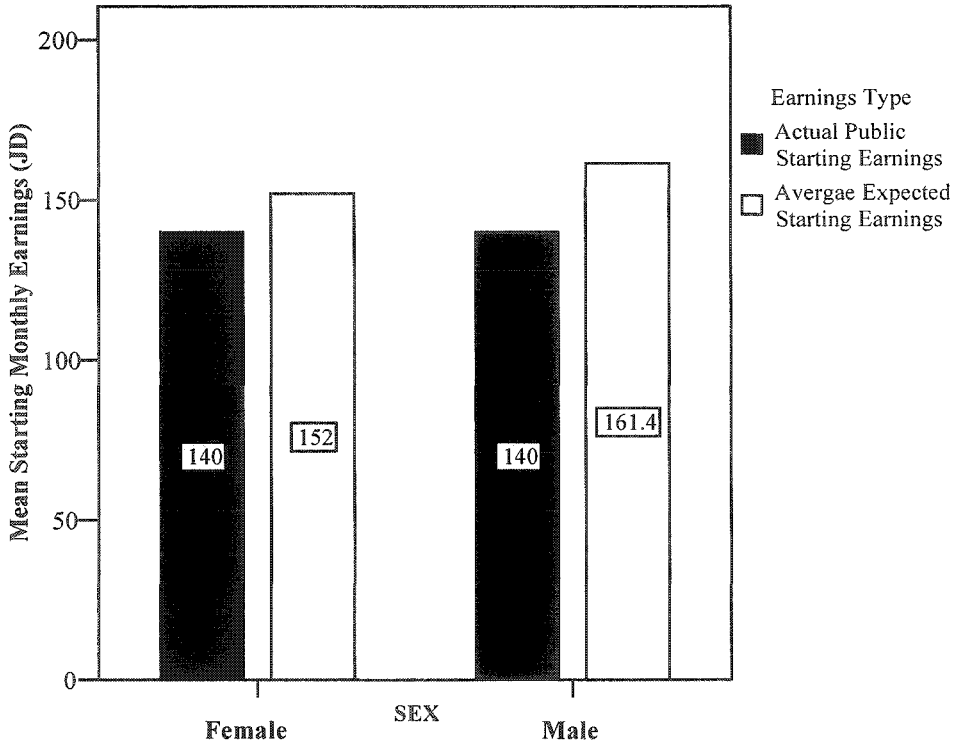
The analysis in this section starts with holding a comparison between what students expect to earn for employment with secondary education and public earnings for the same level of education. Similarly, students' earnings expectations on employment

with various HE fields are used for a comparison with public assigned wage premiums (see sub-section 7.3.2).

7.3.1 The case of secondary education

Figure 7.8 depicts a comparison between expected (variables 1ES and 2ES in Table 7.1) and actual public sector starting earnings with secondary education.

Figure 7.8: A comparison between expected and actual monthly starting earnings for secondary education by sex



Students on average apparently expect higher earnings than those the public sector currently pay for career entry points. However, of course, the percentage deviations of the means from the actual earnings differ by sex, as the mean for females deviated by almost 8.6% (JD152 relative to JD140), while for males it deviated by 15.3% (JD161.4 relative to JD140). This suggests that, on average, females' perceived starting earnings are relatively closer to actual public earnings. Because on average

the deviation does exceed 8%, one may not suggest that students, particularly males, tend to rely on the current prevailing earnings to form earnings expectations when it comes to secondary education. However, such a conclusion requires a more precise statistical examination to take into account whether such a positive difference is statistically significant or merely an apparent one. This can be achieved by applying the one-sample *t* test procedure, which tests whether or not the mean of a single variable - in this case the mean of expected starting earnings - differs from a specified constant. Of course, public starting earnings are actually constant, assuming that all the students have no previous experience and are not married. Consequently, the test in this case examines the null hypothesis that mean expected starting earnings is equal to JD140 (public starting earnings for secondary education). It should be noted here that the alternative hypothesis is two-tailed, as we do not have a particular prior expectation on the direction and magnitude of the difference.

Table 7.6 reports the *t* test results for mean expected starting earnings for secondary education broken down by gender and area of residence. Although individual patterns vary by gender and area, the null hypothesis is very significantly rejected, as the *p*-value in most cases is extremely low. These results are consistent with the descriptive analysis above that student starting earnings expectations are greater than those actually assigned in the public sector. Taking into account the 95% confidence interval results reported in the table, the overall difference ranges on average positively and significantly between around JD14.5 and JD18.40, which in percentage terms is between10.4% and 13% above actual public starting earnings.

Table 7.6: One-sample *t* Test for expected starting earnings conditional on secondary education

Group	Mean	Observations	Null Hypothesis*	*t*	*p*-value (2-tailed)	95% Confidence Interval of the Difference	
						Lower	Upper
Female	152.01	375	*Mean* =140	7.759	0.000	8.97	15.06
Male	161.41	333	*Mean* =140	19.011	0.000	19.20	23.63
Urban	164.15	300	*Mean* =140	16.055	0.000	21.19	27.11
Rural	153.83	254	*Mean* =140	9.578	0.000	10.63	16.13
Nomadic	146.44	154	*Mean* =140	2.762	0.006	1.83	11.05
Overall	**156.43**	**708**	***Mean* =140**	**16.575**	**0.000**	**14.49**	**18.38**

*The Null hypothesis is: the average expected starting earnings for a particular student group is equal to the public starting earnings, which is JD 140 monthly. The null hypothesis is very significantly rejected for all groups (see *p*-value column).

7.3.2 The case of HE

Similarly, it is important to examine the earnings expectations elicited for employment with HE compared with actual public sector earnings. Instead of considering HE on average, and since public sector earnings for HE vary by field of study, the approach here is to employ students' responses on starting earnings for their preferred HE field groups (variable 1EH only). To make the comparison easier and more reliable, students' starting earnings expectations were grouped into eight distinct occupational groups following the public sector earnings structure. Therefore, the data in Figure 7.5 contributes to demonstrating the difference between public earnings and expected earnings for HE fields. The monthly starting earnings offered by the public sector for newcomers with various HE field groups are shown in Figure 7.9. Also, the analysis employs the *t* test as in the case of secondary education in the previous section. Table 7.7 reports the results of the latter test.

Figure 7.9: Monthly starting earnings for higher education as assigned by the public sector in Jordan

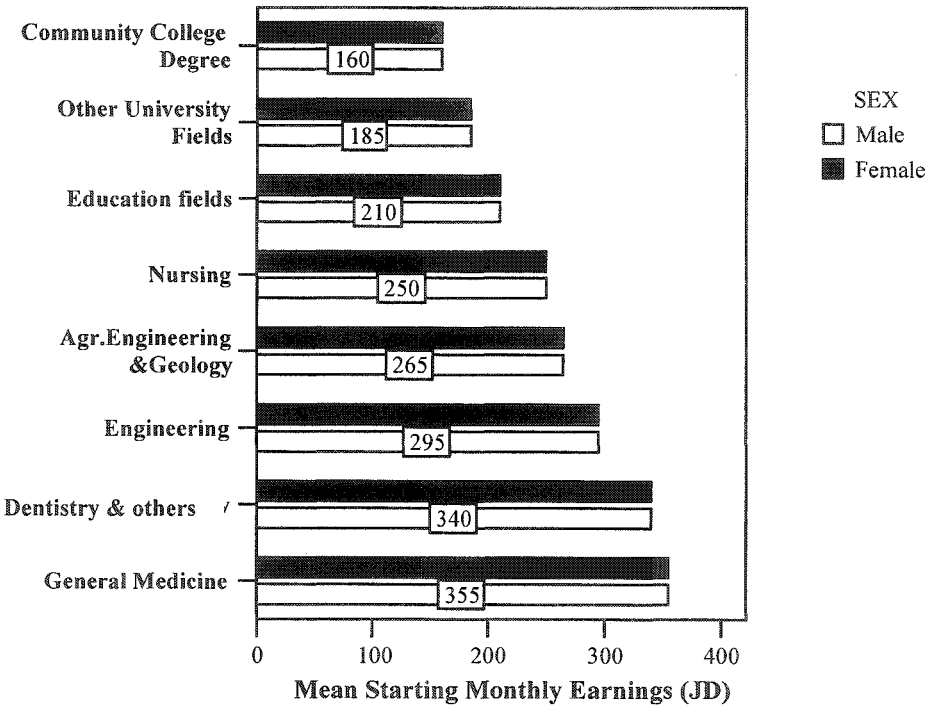


Table 7.7: One-sample *t* Test for expected starting earnings conditional on HE fields

Group	Mean	Observations	Null Hypothesis*	*t*	*p*-value (2-tailed)	95% Confidence Interval of the Difference Lower	Upper
General medicine	391.36	27	*H0 = 355*	8.189	0.000	27.129	45.600
Dentistry & others	378.04	30	*H0 =340*	8.650	0.000	28.930	47.164
Engineering	320.98	59	*H0 =295*	5.026	0.000	15.620	36.343
Agr. Engineering & geology	293.24	20	*H0 =265*	3.457	0.003	10.920	45.551
Nursing	292.12	28	*H0 =250*	7.737	0.000	30.905	53.326
Education fields	241.37	113	*H0 =210*	14.420	0.000	27.656	35.676
Other uni. fields	224.39	108	*H0 =185*	19.222	0.000	35.330	43.456
Community college	177.70	102	*H0 =160*	12.059	0.000	14.785	20.607

* The Null hypothesis is: the average expected starting earnings for a particular student group equals the public starting earnings assigned which varies across groups. The null hypothesis is significantly rejected for all groups (see *p*-value column).

Figure 7.9 shows that those employed with general medicine degrees, according to the civil service system, earn JD355 monthly, while those holding dentistry, veterinary medicine, and pharmaceutics university degrees earn JD340. Engineering

sciences rank third with engineering studies graduates receiving JD295 monthly. A university degree in agricultural engineering results in wages of JD265 per month, equalling the amount paid for those graduating in geology. Nursing graduates working for the first time in the state sector are paid JD250. In the last five years or so, the government has introduced a plan to increase the earnings of teachers. This has led to graduates in education fields (such as maths, languages, history, geography, education) increasing their earnings. They currently receive JD210 monthly. In comparison, other university degrees (such as business, economics, philosophy, accountancy, and finance) earn JD185, which is the second lowest category of public starting earnings. The lowest-paid category is community college education, which usually lasts for shorter periods than university education and is assigned monthly payments equal to JD160.

Comparing the starting earnings expected by the students about different HE fields with those actually prevailing within the public sector, Figures 7.9 and 7.5 together, shows that in forming their expectations on earnings students tend to match quite well the structure of earnings prevailing in the labour market as approximated by public earnings for HE fields compared with secondary education. Students irrespective of gender and fields perceived that more education results in more earnings as on average HE is perceived to reap more earnings than secondary education. The students appear to know about the structure of earnings in different HE fields too. Those students preferring to study general medicine, for instance, expected to earn more than students from the other groups, which corresponds to the actual pattern existing in the labour market. On the other hand, those preferring to opt for community college education expected on average the lowest level of

earnings, again reflecting the pattern taking place in the public sector. These observed patterns were supported by the model estimated above in Table 7.3b as well.

Nevertheless, the comparison between actual public sector and expected earnings shows that students predicted that they would earn substantially more than the current actual earnings. Students of general medicine perceived higher pay-offs of their intended degrees by around 10%, on average. With respect to other subject fields, the percentage differences between what students anticipated and current public earnings ranged from 8.8% for engineering and 21% for the group, 'other university fields'. Table 7.7 shows that all these differences are highly significant and positive based on the one-sample *t* test.

In effect, it would be acceptable to conclude that, on average, students tend to perceive higher earnings than those prevailing in the labour market currently for different HE fields. This means that students possibly do not look at the current levels of earnings when they build their earnings expectations, but rather they may expect increases in starting earnings to happen after graduation from HE.

However, according to the current economic situation in Jordan, it appears that public sector starting earnings are not likely to increase in due course as result of the chronic deficit facing the public budget. Also, despite the latter fact, even if the monthly earnings were to increase they would not increase by such high percentages as 22% or even 8%. So, the above analysis tends to support the idea that students are not well-informed about the benefits of HE in Jordan, possibly due to weak

information channels. In effect, students in Jordan, particularly in the area of AlKarak, overestimate the earnings resulting from HE. Table 7.8 also provides alternative support for this conclusion. It also incorporates the use of the one-sample *t* test to compare the actual and expected net gain for HE for various field groups, which is computed as the difference between starting earnings for secondary education and HE. The majority of students intending to continue into HE are found to overestimate the current net gain between earnings for HE and secondary education. Such a finding will impact on the calculation of the ERRs and will result in expecting higher rates than those prevailing in the labour market. Furthermore, it indicates that students on average apparently overestimate, or are overoptimistic on, the net gains or monetary benefits of continuing into HE. The latter results possibly impact on the incidence of higher demand for HE in the context of Jordan, through the mechanism of ERRs (see below and the following chapter).

Table 7.8: One-sample *t* test for expected net gain for HE field groups

Group	Mean	Observations	Null Hypothesis*	*t*	Sig. (2-tailed)	95% Confidence Interval of the Difference	
						Lower	Upper
General medicine	229.770	27	*H0* = 215	1.568	0.132	-4.824	34.369
Dentistry and others	210.000	30	*H0* =200	1.556	0.134	-3.329	23.329
Engineering	163.680	59	*H0* =155	1.327	0.190	-4.429	21.786
Agricultural engineering & geology	139.000	20	*H0* =125	2.377	0.030	1.517	26.483
Nursing	140.380	28	*H0* = 110	5.431	0.000	18.862	41.907
Education fields	88.250	113	*H0* = 70	6.332	0.000	12.539	23.691
Other university fields	76.430	108	*H0* = 45	12.293	0.000	26.361	36.499
Community college	32.860	102	*H0* = 20	7.318	0.000	9.376	16.350

*The Null hypothesis is: the average net gain expected for a particular HE group is equal to that actually prevailing within the public sector. The null hypothesis is significantly rejected for five out of eight groups (see *p*-value column).

7.4 Short-cut ERRs to HE

So far, the analysis has mainly shown that Jordan's final year-secondary students' earnings expectations are to a very great extent influenced by post-secondary stage decisions on education levels and types (secondary vs. HE and among HE group fields). Also, earnings expectations, or in other words expected net gains and expected opportunity costs, have been found to vary, with different degrees of significance, across gender, area of residence and HE field group. Individual differences in earnings expectations of course imply differences in individual ERRs, which in turn would impact on one's likelihood to continue into HE.

The final section here applies the short-cut method to calculate the ERR per student required for the logistic regression in the next chapter, and for different genders, areas of residence and HE field groups, which will be used in comparing the study's results with actual returns measured for Jordan and ERRs in other international studies.

As discussed in Chapters Five and Six, the short-cut method for calculating ERR can be used both with the inclusion of only the perceived opportunity costs and with the addition of a measure of HE costs. Therefore, this section calculates ERRs based on only the opportunity costs, the indirect costs of HE student time via the means of individual expected foregone earnings; and based on the further inclusion of a measure of the direct costs of HE (HE fees). Regarding the latter, the analysis takes advantage of the questionnaire questions regarding students' preferred HE fields and institutions to incorporate HE fees into the analysis. Those belonging to the employment group, however, were hypothesized to bear the average of HE costs for

the demand group if they were to decide to continue into HE. Appendix (5) provides data on the average fees charged by HE public institutions for different HE subject areas.

Tables 7.9 and 7.10 summarise the findings of the short-cut ERRs calculations broken down by gender, area of residence and HE field group. Also, they report the *t* test results for means inequality across gender within each sub-group, which tests the null hypothesis that the means of two groups are equal. In some cases, the results of the non-parametric Mann-Whitney U test are also given for those groups with a sample size of less than 30[4]. Based on the data in these tables, the next two sub-sections consider the average ERRs to HE as a whole, as well as the average ERRs to each HE field group.

7.4.1 Average ERRs to HE

Due to gender differences in earnings expectations, it was perhaps unsurprising to find that ERRs measured for females on average were greater than those for male students, as shown in Table 7.9. Females' average expected rate of return to HE significantly exceeded that of males by around 2.8% (15.6% relatively to 12.8% in the case of including merely the opportunity costs) and 1.35% (10.1% relatively to 8.9% in case of including both opportunity cost and HE fees). The greater ERRs for female students over males is attributed to the fact that, on average, females perceived lower foregone earnings (opportunity costs) compared with males, as shown in the previous sections. However, when the data is segregated by area, the corresponding *t* test for means inequality shown in the last column indicates that the gender difference is not significant in the urban areas, whereas it is significant for the

other two areas (beyond the 0.05 level and 0.01 for the rural and nomadic areas respectively). Yet, one can reasonably conclude that female students on average expected a greater return, as supported by the results in the first row of the table (where t value is significant at a p value <0.01). Also, it seems that area differences in ERRs are statistically insignificant. Levene's test for homogeneity rejected the null hypothesis that the variances of the three areas are equal, so the analysis employed the non-parametric Kruskal-Wallis test, which is equivalent to the parametric ANOVA test. The test is recommended in cases where the variance is heterogeneous across the groups examined. The results of this test are reported in the lower panel of Table 7.10. The chi-square value and its p level (χ^2 (2)= 0.591, p=0.744) in this test show that the mean difference in ERR adjusted for opportunity costs is not significant across area of residence. A very similar result is found for the case of the ERR, adjusted for both type of costs (χ^2 (2) = 0.542, p=0.762)

Table 7.9 shows that the average ERR, regardless of gender and area and when adjusted to HE fees, is lower than the corresponding ERR considering only the opportunity costs as perceived by the students. The difference, on average, amounts to nearly 4%. In this case the rates are lower since the size of the divisor in the short-cut formula has increased by a substantial amount, resulting in a 43% decline (14.3% relative to 10%) on average in the return. In other words, on average, as HE fees in Jordan are relatively high and are expected to increase over the years to come, the measurement of return to HE based on actual data should take into account the possibility that RORs are upwardly biased. However, although no one could argue against the upward bias resulting from ignoring the direct costs of education, the later percentage of 43% might not precisely reflect the upward pressure from ignoring HE

fees, as the analysis is restricted to expected starting earnings. For example, the well-known and commonly applied Mincerian method of RORs relies on cross-sectional data that typically includes different people with different earnings, levels of education and ages (or experience). Consequently, the method implies that people undertake education in different periods of time, meaning different levels of direct costs of education even for the same education levels and types.

Lastly, it is worth mentioning at this stage that, although different, the two short-cut ERRs measured (with and without HE fees) proved to be very highly correlated (at around 90%). This is ascribed to the fact that HE fees for each type of education vary only negligibly among HE institutions in Jordan. Also, the methodology of the study has contributed to this high correlation, as those belonging to the employment group were assumed to bear the average HE fees. While these two points led to adjusting the ERR approximately by the average HE fees, they resulted in a high linear relationship between the two types of ERR. This observation is particularly important to bear in mind when considering logistic regression in the next chapter. Since both types ERRs are highly correlated, they gave similar results in the examination of student demand for HE. Hence, the logistic regression analysis depends on using the ERR adjusted only for the opportunity costs as to investigate the student demand for HE (see next chapter). An interesting finding with particularly suggestive evidence concerning student demand for HE also lies in the comparison between mean ERRs for the demand group and the employment group in Table 7.9. The mean ERR pertaining to the former group is on average significantly and substantially greater than that of the employment group. Such a difference, of course, results from individual differences in expectations on the gains and

opportunity costs for HE, and implies on average a relationship between the decision to continue into HE and ERRs.

Table 7.9: Short-cut ERRs to HE on average by sex and area

	ERR opportunity Costs only	ERR opportunity costs and HE fees	Means inequality test)*	
			ERR opportunity costs only	ERR opportunity costs and HE fees
On average [708]	0.143 (0.103)**	0.100 (0.065)		
Female [375]	0.156 (0.109)	0.101 (0.070)	t= 3.695***, EVN	t= 4.412***, EVN
Male [333]	0.128 (0.093)	0.089 (0.058)		
Employment group [221]	0.087 (0.089)	0.064 (0.066)	t= -11.465***, EVA	t= -10.935***, EVN
Demand group [487]	0.172 (0.097)	0.118 (0.057)		
Urban On average[300]	0.138 (0.088)			
Urban female[159]	0.144 (0.087)	0.104 (0.059)	t= 1.068 , EVA	t= 1.434 , EVA
Urban male[141]	0.132 (0.091)	0.095 (0.058)		
Rural On average[254]	0.1416 (0.104)	0.097 (0.064)		
Rural Female[132]	0.156 (0.109)	0.109 (0.070)	t= 2.281****, EVA	t= 3.251***, EVA
Rural male[122]	0.126 (0.096)	0.083 (0.055)		
Nomadic On average[154]	0.153 (0.125)	0.104 (0.078)		
Nomadic female[84]	0.179 (0.141)	0.120 (0.087)	t= 3.088***, EVN	t= 2.982 (0.003), EVN
Nomadic male[70]	0.121 (0.093)	0.084 (0.060)		

Kruskal-Wallis test results of H_0 : means by area are equal	
ERR (opportunity costs only)	ERR (opportunity costs and HE fees)
Chi-sequre (2) =0.591 Asymp. Sig =0.744	Chi-sequre (2) =0.542 Asymp. Sig =0.762

*EVA is equality of variance between the two gender group is assumed based on Levene's test, while EVN symbolises the opposite. t test for mean inequality in this table tests H_0: Females' ERR mean=Males' ERR mean. An exception is the test for mean of employment group vs. the demand group's. **Standard deviations are reported in parentheses, while numbers of participants are in brackets. *** Significant at p<0.001, **** significant at p<0.005

7.4.2 ERRs to HE field groups

Table 7.10 reports the ERRs (with/without HE fees) as measured by the short-cut method for each HE field group. In this case, the analysis draws merely on the responses of demand group (variables 2ES and 1EH in Table 7.1) reported by 487 students out of the 708 participants.

Table 7.10: Short-cut ERRs to HE field group by sex

	ERR (opp. Costs only)	ERR (opp. costs and HE fees)	Mean equality test*	
			ERR (opp. Costs only)	ERR (opp. costs and HE fees)
General medicine			t= -0.411, EVA Mann-Whitney U test failed to show significance too	t= -0.606, EVN Mann-Whitney U test failed to show significance too
On average [27]	0.301 (0.080)	0.133 (0.0304)		
Female[10]	0.281 (0.134)	0.122 (0.053)		
Male [17]	0.307 (0.062)	0.136 (0.021)		
Dentistry			t= 1.016 , EVA Mann-Whitney U test failed to show significance too	t= 0.756, EVA Mann-Whitney U test failed to show significance too
On average [30]	0.268 (0.100)	0.152 (0.040)		
Female[14]	0.288 (0.124)	0.158 (0.047)		
Male [16]	0.245 (0.065)	0.145 (0.031)		
Engineering			t= 1.480, EVA Mann-Whitney U test failed to show significance too	t= 1.050, EVA Mann-Whitney U test failed to show significance too
On average [59]	0.220 (0.084)	0.139 (0.048)		
Female[28]	0.237 (0.084)	0.146 (0.044)		
Male [31]	0.204 (0.0814)	0.133 (0.050)		
Nursing			t= 2.607****, EVN Mann-Whitney U test is significant too	t= 2.577****, EVN Mann-Whitney U test is significant too
On average [28]	0.248 (0.102)	0.177 (0.059)		
Female[16]	0.289 (0.123)	0.201 (0.070)		
Male [12]	0.200 (0.035)	0.149 (0.025)		
Agr. Engineering & geology			t= 1.445, EVN Mann-Whitney U test failed to show significance too	t= 1.221, EVN Mann-Whitney U test failed to show significance too
On average [20]	0.230 (0.051)	0.168 (0.034)		
Female[9]	0.249 (0.066)	0.179 (0.044)		
Male [11]	0.213 (0.027)	0.158 (0.019)		
Education fields			t= 0.497, EVA	t= 0.233, EVN
On average [113]	0.156 (0.0786)	0.112 (0.051)		
Female[64]	0.159 (0.091)	0.113 (0.057)		
Male [49]	0.152 (0.06)	0.111 (0.041)		
Other university fields			t= 5.847***, EVN	t= 5.656***, EVN
On average [108]	0.139 (0.064)	0.106 (0.046)		
Female[55]	0.167 (0.070)	0.127 (0.050)		
Male [53]	0.105 (0.035)	0.083 (0.027)		
Community college			t= 4.033***, EVN	t= 3.811***, EVN
On average[102]	0.123 (0.094)	0.093 (0.065)		
Female[54]	0.152 (0.108)	0.114 (0.072)		
Male [48]	0.084 (0.051)	0.066 (0.039)		

Kruskal-Wallis test results of H_0 : means by area are equal	
ERR (opp. Costs only)	ERR (opp. costs and HE fees)
Chi-square (7) =153.954	Chi-square (7) =107.023
Asymp. Sig =0.000	Asymp. Sig =0.000

*EVA is equality of variance between the two gender group is assumed based on Levene's test, while EVN symbolises the opposite. t test for mean equality in this table tests H_0: Females' ERR mean=Males' ERR mean. **Standard deviations are reported in parentheses, while numbers of participants are in brackets. *** Significant at p<0.001, **** significant at p<0.005

As some of the field groups consisted of small numbers of participants (less than 30), the analysis in Table 7.10 focused upon gender differences within each group and occasionally had to use non-parametric techniques to examine mean differences by gender alongside parametric techniques. However, as reported in the table, both techniques yielded similar results. Also, in the case of area differences in Table 7.9, and for the same reason, Kruskal-Wallis test was used instead of the ANOVA test to detect the significance of differences in ERR means across HE field groups[5].

Table 7.7 shows that the average ERRs for medical sciences were the highest compared with the other fields, in the case of including only opportunity costs, regardless of sex (about 31%). The lowest rates predicted within the sample participants were found in the group preferring to enrol in community college education (12.3% on average). This average patterns change to a great extent when the analysis controls for HE fees, whereupon the nursing fields moved into top position, as a result of differences in HE fees. Students from the nursing group seemed to greatly overestimate the net gain of their degrees, and their fees are lower than those paid by medical, dentistry and engineering students. Therefore, they expected the highest ERR to a HE degree after adjusting for fees. The same factors affect the sizes of measured rates for the other groups. Nursing is followed by agricultural engineering and geology. The lowest return measured is around 9% for community college degrees. Taking into account the fees for studying general medicine, which are the highest in Jordan, the rates of return for this field dropped sharply to around 13% compared to 31%. The drop in other fields varies from as low as 3% in education and community colleges, to as high as 11% in the dentistry group.

Gender differences remain in favour of females (except in the case of general medicine), however, these are insignificant in five out of the eight field groups regarding both types of ERR. The highest significant differences in favour of females is found for community college and nursing education, where females are more likely to enrol, in the sample and in practice. This suggests a direct relationship between ERRs and demand for HE. Also, Table 7.10 reveals that most of the students preferred to go into HE subjects where ERRs adjusted for foregone earnings is relatively low. This is due to the fact that studying subjects, such as medicine and dentistry, in Jordan involve substantially greater amount of direct costs (e.g. tuition fees) and require longer time to obtain. This observation is reflected in the calculation of ERRs assuming both the opportunity and direct costs (Table 7.10). Additionally, as will be seen in the next chapter, student demand for HE is influenced positively by students' academic ability. So, students appear to self-select into HE areas based on their academic abilities, which may to some extent reflect the risk of non-completion of HE degrees. Simply put, a student with low academic ability might not choose to undertake undergraduate degree in medicine, for example, as he/she perceives greater risk of failing in HE and losing a lot of money as a result, in terms of educational costs.

Finally, the Kruskal-Wallis test reported in Table 7.7 indicates that the mean ERR differences among HE fields for both with and without the inclusion of HE fees are significant beyond the 0.01 probability level (χ^2 (7) = 107.033 and 153.954 for the two types respectively). This obviously gives direct support to the notion that students perceive the differences in return to different education levels and types, which was also evident in the previous sections.

7.5 Conclusion

In this chapter, the first part of the empirical analysis of the study has been carried out. The second part is conduced in the following chapter. Mainly, the analysis has examined the data for students' expected starting earnings gathered during the fieldwork of the study, using different and complementary statistical techniques (descriptive statistics, multiple regression, parametric and non-parametric means equality tests).

Similar to most of the studies in this area (see Chapter Five), the findings in this chapter showed that education was significantly and highly associated with students' earnings expectations. This result was affirmed by both descriptive and regression analyses. Those reporting that they were more likely to continue into HE (the demand group) expected higher starting earnings than the employment group (those revealing that they were most likely going to search for employment after secondary education). The results pertaining to the short-cut ERRs reported in the present chapter are in line with the evidence reported in earlier studies of Psacharopoulos & Sanyal (1981; 1982); Menon (1997a), and, more recently, Hung et al (2000). ERRs to HE turned out to be positive and substantially high, especially among those students from the demand group (those planning to continue into HE).

Overall, earnings expectations were found in this study to vary by gender and area of residence. Female students appeared to expect lower earnings for both secondary education and HE in comparison with males. This resulted in females expecting significantly higher net gains for pursuing HE, and in effect higher ERRs. However, area-based differences in earnings expectations in favour of urban students as

opposed to those from rural and nomadic areas translated into higher ERRs for Jordan's non-urban students, but these were not statistically significant on average.

In addition to measuring ERRs on average and per student using short-cut method, the findings reported in this chapter have produced suggestive evidence on the comparability between student earnings expectations and what the public sector offers in reality. The findings showed that secondary school students in Jordan were somewhat overoptimistic about starting earnings relative to actual state starting wage premiums. This primarily suggests that students might consider future wage rates rather than those prevailing currently with tendency to overestimate the pay-offs of education, possibly due to lack of enough information on the labour market. In effect, the present study provides different evidence from that reported in Carvajal et al (2000) and Wolter (2000), who both, however, applied different approaches (see chapter five). They showed that students built their earnings expectations on the prevalent wage rates. These facts should be taken into account in future research on demand for HE. Using the current cross-sectional earnings data in the context of Jordan tend not to precisely reflect ERRs and in turn student demand for HE. Furthermore, students appeared to overestimate ERRs which were constructed based on students' subjective earnings expectations. This observation was indirectly supported by the comparison between expected and actual net gain for secondary and HE fields. Also, ERRs adjusted only for the foregone earnings in the current study exceeded those estimated by Talafeh (2003, see Chapter Four) by more than 3 % for both sexes. The latter deviation could be attributable to the difference in the method used and sample structure as the data set applied by Talafeh consisted mainly of men unlike the present study. Also, the difference between the two studies supports the

above suggestion that students might be overoptimistic about the earnings of employment with HE degrees.

Table 7.2a: Results of the simultaneous OLS estimation of the expected starting earnings (pooled for the sample N=708)

Variable*	Coefficient	t-statistics	*p* value
(Constant)	148.033	8.724	0.000
Post-secondary decision (search for employment=0)	83.624	17.448	0.000
Sex (Female=0)	12.471	2.830	0.005
Sector preferred for employment (Private=0)	-7.234	-1.387	0.166
Average of marks	0.277	1.294	0.196
Family monthly income (Less than 250=0)			
≥JD 250 ≤ JD 299	2.566	0.440	0.660
≥JD 300 ≤ JD 349	4.766	0.656	0.512
≥JD 350 ≤ JD 399	0.158	0.018	0.986
≥JD 400 ≤ JD 449	12.471	1.368	0.172
≥JD 450 ≤ JD 499	1.210	0.124	0.902
≥JD 500 ≤ JD 549	9.696	0.778	0.437
≥JD 550	18.794	1.713	0.087
Area of residence (Urban=0)			
Rural	-2.205	-0.434	0.664
Nomadic	-6.995	-1.148	0.251
Father's education (Illiterate=0)			
Elementary	-1.317	-0.151	0.880
Basic	-0.618	-0.083	0.934
Secondary	-3.645	-0.462	0.645
I. Diploma	-1.293	-0.124	0.901
University and higher	-5.626	-0.564	0.573
Mother's education (Illiterate=0)			
Elementary	0.677	0.081	0.936
Basic	-7.780	-1.067	0.286
Secondary	3.327	0.493	0.622
I. Diploma	-2.773	-0.325	0.746
University and higher	8.377	0.633	0.527
Model Summary statistics:			
R^2	0.149		
Adjusted R^2	0.122		
F-statistics	5.457		
p value (F-statistics)	0.000		

*Dependent variable represents responses on variables 1ES and 1EH Table 7.1. *The variance inflation factor (VIF) values for all independent variables were less than 3.

Table 7.3a: Results of the simultaneous OLS estimation of the expected starting earnings for HE field groups (sample N=487)			
Variable*	**Coefficient**	**t-statistics**	***p* value**
(Constant)	388.528	36.430	0.000
HE preferred field (General medicine =0)			
Dentistry & others	-11.050	-1.583	0.114
Engineering	-72.056	-12.136	0.000
Nursing	-98.831	-14.413	0.000
Agr. Engineering & geology	-95.552	-12.522	0.000
Education fields	-156.148	-27.976	0.000
Other university fields	-171.639	-31.078	0.000
Community college	-215.636	-38.863	0.000
Sector preferred for employment (Private=0)	5.033	1.742	0.082
Area of residence (Urban=0)			
Rural	-13.800	-4.869	0.000
Nomadic	-20.500	-5.981	0.000
Average of Marks	0.191	1.634	0.103
Family monthly income (Less than 250=0) ≥JD 250 ≤ JD 299	0.588	0.180	0.857
≥JD 300 ≤ JD 349	-1.984	-0.538	0.591
≥JD 350 ≤ JD 399	-0.509	-0.112	0.911
≥JD 400 ≤ JD 449	-5.581	-1.211	0.227
≥JD 450 ≤ JD 499	-1.543	-0.314	0.753
≥JD 500 ≤ JD 549	-7.771	-1.257	0.209
≥JD 550	-0.599	-0.109	0.914
Father's education (Illiterate=0) Elementary	-3.684	-0.806	0.421
Basic	-5.666	-1.404	0.161
Secondary	-5.942	-1.432	0.153
I. Diploma	-5.351	-1.025	0.306
University and higher	0.919	0.183	0.855
Mother's education (Illiterate=0) Elementary	-1.446	-0.329	0.742
Basic	2.833	0.730	0.466
Secondary	3.702	1.035	0.301
I. Diploma	1.666	0.386	0.699
University and higher	-2.476	-0.375	0.708
Sex (Female=0)	0.730	0.320	0.749
Model Summary statistics:			
R^2	0.888		
Adjusted R^2	0.880		
F-statistics	118.425		
p value (F-statistics)	0.000		

*Dependent variable represents responses on variables 1EH Table 7.1. *The variance inflation factor (VIF) values for all independent variables were less than 5.

Table 7.4a: Results of the simultaneous OLS estimation of the expected starting earnings for secondary education (sample N=708)			
Variable*	**Coefficient**	****t-statistics**	***p* value**
(Constant)	176.788	24.934	0.000
Sex (Female=0)	9.057	4.913	0.000
Sector preferred for employment (Private=0)	-4.119	-1.804	0.072
Average of marks	-0.165	-1.873	0.062
Family monthly income (Less than 250=0)			
≥JD 250 ≤ JD 299	-0.833	-0.332	0.740
≥JD 300 ≤ JD 349	-12.614	-4.475	0.000
≥JD 350 ≤ JD 399	-0.194	-0.041	0.967
≥JD 400 ≤ JD 449	-7.152	-2.039	0.042
≥JD 450 ≤ JD 499	-4.682	-1.039	0.299
≥JD 500 ≤ JD 549	-0.440	-0.080	0.936
≥JD 550	0.882	0.182	0.856
Area of residence (Urban=0)			
Rural	-12.062	-5.732	0.000
Nomadic	-16.820	-5.725	0.000
Father's education (Illiterate=0)			
Elementary	5.103	1.504	0.133
Basic	-2.025	-0.652	0.515
Secondary	4.202	1.205	0.229
I. Diploma	3.997	0.816	0.415
University and higher	-0.476	-0.114	0.909
Mother's education (Illiterate=0)			
Elementary	1.498	0.399	0.690
Basic	-2.324	-0.784	0.433
Secondary	-0.238	-0.076	0.940
I. Diploma	-0.145	-0.037	0.970
University and higher	-0.777	-0.130	0.897
Model Summary statistics:			
R^2	0.149		
Adjusted R^2	0.122		
F-statistics	5.457		
p value (F-statistics)	0.000		

* Dependent variable represents responses on variables 1ES and 2ES Table 7.1. *The variance inflation factor (VIF) values for all independent variables were less than 3. ** t values reported are based on white's Heteroskedasticity-consistent standard errors

Table 7.5a: Results of the simultaneous OLS estimation of the expected starting earnings for HE (sample N=708)

Variable*	Coefficient	**t-statistics	*p* value
(Constant)	188.502	9.963	0.000
Sex (Female=0)	11.026	2.199	0.028
Sector preferred for employment (Private=0)	-0.067	-1.622	0.105
Average of marks	0.778	3.409	0.001
Family Income (Less than 250=0)			
≥JD 250 ≤ JD 299	-0.167	-0.025	0.980
≥JD 300 ≤ JD 349	8.083	0.921	0.357
≥JD 350 ≤ JD 399	-3.809	-0.351	0.726
≥JD 400 ≤ JD 449	18.122	1.560	0.119
≥JD 450 ≤ JD 499	-1.040	-0.102	0.919
≥JD 500 ≤ JD 549	8.918	0.664	0.507
≥JD 550	10.196	0.718	0.473
Area of residence (Urban=0)			
Rural	-8.039	-1.375	0.170
Nomadic	-19.652	-2.974	0.003
Father's education (Illiterate=0)			
Elementary	0.035	0.003	0.997
Basic	10.756	1.195	0.233
Secondary	1.565	0.164	0.870
I. Diploma	4.151	0.374	0.708
University and higher	2.055	0.171	0.864
Mother's education (Illiterate=0)			
Elementary	-3.504	-0.375	0.708
Basic	-11.239	-1.363	0.173
Secondary	4.934	0.608	0.543
I. Diploma	-1.550	-0.164	0.869
University and higher	-0.230	-0.013	0.989
Model Summary statistics:			
R^2	0.055		
Adjusted R^2	0.025		
F-statistics	1.819		
p value (F-statistics)	0.013		

* Dependent variable represents responses on variables 1EH and 2EH Table 7.1 * The variance inflation factor (VIF) values for all independent variables were less than 3. ** t values reported are based on white's Heteroskedasticity-consistent standard errors.

[1]Actually, in this regard, theory implies that students are further well-informed on the fact that employers use education only as an information/productivity differentiating device.

[2]In using stepwise regression procedures, the significance level ("*p*-value") for entry or removal from the models was set at 0.15.

[3] About 78% of the participants revealed their preference for being employed in the public sector rather than the private sector. This observation is not strange as public employment is thought to be more secure in Jordan and other Arab countries (Al-Sana'a & Wadee, 2003).

[4] Mann-Whitney U test, as a non-parametric test actually depends on the median rather than the mean in exploring the difference between the scores of the two groups (males and females). It assumes that the sample is drawn randomly and does not assume the normality of the variable, which was violated by some subgroups involved in the analysis.

[5] Actually, ANOVA was also applied on the data in case of both Table 7.9 and 7.10 and gave the same results in terms of rejection or non-rejection of the null hypothesis that the means are equal.

CHAPTER EIGHT
VARIABLES OF STUDENT DEMAND FOR HE IN JORDAN: EMPIRICAL ANALYSIS

8.1 Introduction

This chapter draws mainly on logistic regression techniques (see Chapter Six) to investigate variables influencing student demand for HE in Jordan, including the effect of ERR which was measured per student in the previous chapter. Besides this variable, the literature of student demand for HE has documented evidence of the effect of other variables suggested by the basic model of economic theory (basically student ability and income). Also, several studies have emphasized the importance of variables such as labour market conditions, gender, parents' education, student's area of residence, and, last but not the least, consumption motives (as discussed in Chapters Four and Five).

The next section of this chapter is concerned with the strategy adopted to model the logistic regression of student demand for HE in Jordan. Section 8.3 analyses and discusses models and findings concerning student demand for HE. Goodness of fit of the estimated logistic models are handled in sub-section 8.3.1, while the effects of ERRs and student ability are considered in the following sub-section. 8.3.3 takes into account the effect of family income and number of siblings. 8.3.4, in turn, discusses the effects of the student's area of residence and gender, incorporating OLS estimation of the variables of academic achievements of the respondents. The influence of labour market conditions and preferences are presented in 8.3.5. It relies on an analysis of a group of Likert-scaled statements related to work and HE in Jordan. In 8.3.6, some of the Likert-

scaled statements designed to examine students' perceptions of the consumption value of education are reflected upon.

8.2 Logistic regression model building process

In this chapter logistic regression techniques are applied to estimate the variables contributing to the prediction of student demand for HE in Jordan. Logistic regression analysis is a standard technique appropriate for econometric estimations when one has a dichotomous dependent variable regressed on different types of explanatory variables (Hosmer and Lemeshow, 2000, see also Chapter Six). The following logistic model was fitted to investigate the association between the dependent variable and the explanatory variables:

$$Y_i = \beta_1 + \beta_j X_i + u_i \quad i = 1, 2, 3, \ldots, 708 \qquad \text{Equation 8.1}$$

In the econometric specification in Equation 8.1, Y is the predicted probability of an observed dichotomous dependent variable, representing student demand for HE. The observed variable takes values of (0, 1). Zero represents the employment group (those intending to search for employment after the secondary education) and one stands for the demand group (those intending to continue into HE). Xs is a vector of explanatory variables (including ERRs). The intercept term is shown as β_1, while β_j are the coefficients to be estimated. Finally, u represents the error term.

The strategy of model building and variable selection in the current logistic estimation is based on both theoretic and empirical criteria. As shown in Chapters Four and Five, the basic economic model, according to the economic theory and particularly the HCT, theorises that ERRs is the prime predictor of student demand for HE. Also it grants influential roles for both resources available for students (family income) and native

ability of students (averages of marks). On the other hand, the literature on student demand for HE in Jordan (i.e Bani Essa, 1995) has found, in addition to students' academic achievements and family income, that parents' level of education has a significant positive impact on the probability of a student to consider enrolling in HE. Also, practically, HE policy makers in Jordan consider regional differences as among the prime obstacles for access to HE. Therefore, student's area of residence is hypothesized to have a significant role. With respect to the broad literature on demand for HE, it has also emphasized many other predictive variables (see Chapter Five). The present analysis also incorporates testing out the impacts of student's number of siblings and number of siblings undertaking HE, which are examined for the first time in the case of Jordan. The number of siblings reflects the family size, which is directly linked to family expenditure. It is relatively high in Jordan and other Arab countries compared with international figures. Consequently, the process of examining the variables of the student demand for HE involves fitting three models; first the basic model; second a simultaneous model showing the influence of all the variables together; and a stepwise logistic model revealing the best set of predictors of the dependent variable. In this regard, the analysis capitalises on the forward stepwise selection procedure[1].

Table 8.1 demonstrates the models built according to the stepwise procedure, which incorporates the basic model (model 3) and the best model (model 5). The table also shows the simultaneous model, which was estimated separately to examine the role of variables suggested by the literature at once and regardless of their statistical desirability. These models are used in the subsequent analysis of the empirical findings of student demand for HE.

Table 8.1: Stepwise and simultaneous logistic regression models of student demand for HE in Jordan (N=708)

Variables	Model 1		Model 2		Model 3 (basic model)		Model 4		Model 5 (best stepwise model)		The simultaneous model	
	EXP(B)	Wald	EXP(B)	Wald	EXP(B)	Wald	EXP(B)	Wald	EXP(B)	Wald	EXP(B)	Wald
Constant	0.466***	22.738	0.993	0.001	0.141***	8.082	0.051***	15.135	0.090***	8.930	0.130**	5.800
Expected rate of return (ERR)	1.139***	104.315	1.152***	102.583	1.145***	94.456	1.154***	97.201	1.151***	92.811	1.157***	94.381
Family monthly income (<250=0)'												
≥JD 250 ≤ JD 299			3.688***	26.976	3.374***	22.966	3.277***	21.257	3.284***	21.110	3.380***	20.701
≥JD 300 ≤ JD 349			2.038*	3.171	2.421**	4.556	2.340**	4.233	2.298**	4.072	2.104*	3.092
≥JD 350 ≤ JD 399			1.140	0.058	0.961	0.005	1.052	0.008	1.082	0.020	1.107	0.030
≥JD 400 ≤ JD 449			0.728	0.275	0.745	0.227	0.675	0.399	0.689	0.350	0.731	0.240
≥JD 450 ≤ JD 499			3.640*	2.880	3.699*	2.858	3.728*	2.921	3.287	20.360	2.843	1.750
≥JD 500 ≤ JD 549			0.418	0.947	0.370	1.191	0.378	1.149	0.410	0.970	0.444	0.772
≥JD 550			1.567	0.277	1.551	0.259	1.649	0.334	1.623	0.312	1.495	0.202
Average of marks					1.028***	8.786	1.036***	13.108	1.034***	11.390	1.030***	8.170
Sex (Female=0)							1.210***	8.732	1.340***	10.101	1.274***	9.311
Number of siblings									0.933**	4.660	0.940*	3.450
Father's education (Illiterate=0)'												
Elementary											0.842	0.190
Basic											0.708	0.830
Secondary											1.054	0.032
I. Diploma											1.459	0.791
University and higher											1.327	0.261

Table 8.1 continues next page

Table 8.1 continues

Number of siblings in HE						1.035	0.220
Mother's education (Illiterate=0)'							
Elementary						1.357	0.580
Basic						0.865	0.111
Secondary						0.827	0.312
I. Diploma						1.707	1.800
University and higher						0.582	0.463
Area of residence (Urban=0)							
Rural						1.042	0.033
Nomadic						0.856	0.282
Summary statistics per model	C. T=77%, $N.R^2$=0.268, , model Chi square=149.615*** HLT(8)=14.030 HLT p-value=0.081	C. T=78.7% $N.R^2$=0432, , model Chi-square=259.573*** HLT(8)=4.119 HLT p-value=0.846	C. T=79.70%, $N.R^2$=0.444, ,model Chi-square = 268.477*** HLT(8)=8.473 HLT p-value=0.389	C. T=79.70%, $N.R^2$=0.460, , model Chi-square =280.62*** HLT(8)=6.388 HLT p-value=0.604	C. T=80.1%, $N.R^2$=0.466, , model Chi-square=285.319*** HLT(8)=6.937 HLT p-value=0.543	C. T=80.1%, $N.R^2$=0.479, ,model Chi square =294.734*** HLT(8)=6.666 HLT p-value=0.573	

C.T=classification table, $N.R^2$= Nagelkerke R^2, while HLT=Hosmer and Lemeshow Test. *i* means coefficients measure marginal influences.*, ** and *** significant at 0.1, 0.05 and 0.01 levels respectively. The variance inflation factor (VIF) values indicated no serious multicollinearity problem.

8.3 Empirical findings

8.3.1 Goodness-of-fit of estimated models

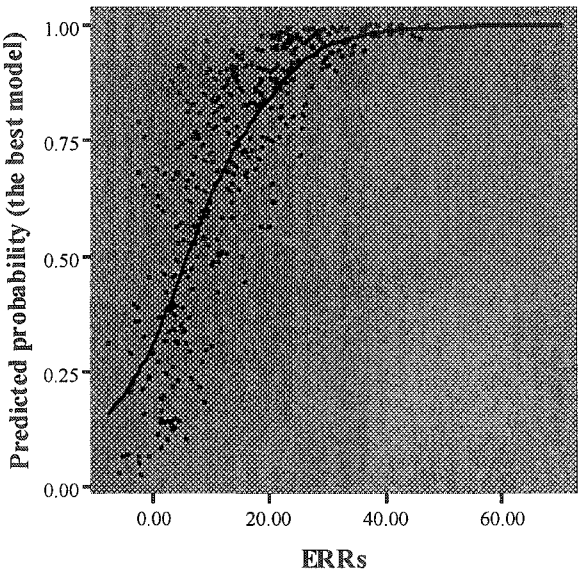
The measures of goodness-of-fit in both the basic and best models (model 3 and 5 in Table 8.1 respectively) appeared to perform well as a whole. The Nagelkerke R^2 varies between 44.4% and almost 46.6% for the two models respectively. These values are acceptable when one considers the fact that in general logistic models are characterised by low values of R^2 (see Cramer, 2003). Also, the classification table and Hosmer and Lemeshow tests indicate that the models predict the dependent variable relatively well. The Hosmer and Lemeshow test does not reject the null hypothesis that there is no difference between the observed and predicted values of the dependent variable at the 0.05 level. The simultaneous model, which includes more variables, does not deviate a great deal regarding goodness of fit statistics when compared with the best model. This is due to the fact the best model incorporates the most predictive variables. These variables are the ERRs, average of marks, family monthly income, number of siblings and gender. The other variables, namely father's education, mothers' education, area of residence and siblings in HE are shown to have no association with the dependent variables. They are statistically approved not desirable to be included in the best model and insignificant when they were controlled for as in the simultaneous one.

The findings of student demand for HE are considered in the following sub-sections. The analysis will optimise on the findings reported in the basic and best models and refer to the simultaneous model where this is deemed to be beneficial.

8.3.2 The effects of ERRs and student academic ability

In both the basic and best models, in Tables 8.1, the Wald statistics shown alongside the odds ratios indicate that ERRs (adjusted for foregone earnings only) predict very significantly and consistently the dependent variable (student demand for HE). This finding is quite pronounced in the result that the odds ratio is higher than 1 (around 1.150 in the best model, which is significant at <0.001), indicating that an increase in ERR by one unit results in an increase in the odds ratio by around 1.150. This means, in other words, that positive increases in ERR positively and significantly increase the probability of a student considering enrolment in HE. The positive influence of ERRs on the demand can also be shown through examining the predicted probabilities. In the previous chapter, the analysis showed that there is an apparent relationship between ERRs and the observed probabilities. Those belonging to the demand group expected noticeably higher ERRs than their counterparts from the employment group. This relationship is found significant in the current logistic regression and as also shown in Figure 8.1. Figure 8.1 scatters the predicted probability according to the best model against ERRs. The shape of predicted probability is non-linear and takes almost an S form. Of course, this figure does not show the influence of the other intervening variables, primarily average of marks and family income (see below), which jointly contribute to the values of the predicted probabilities.

Figure 8.1: The relationship between ERRs and the predicted probabilities of student demand for HE



The economic theory proposes that investment in education from an individual point of view is determined by the rate of return to such an investment, of course as perceived by individuals themselves. The above-mentioned result means that those students expecting higher rates of return are more likely to enrol in HE after the secondary education stage. Accordingly, it can be argued that at the individual level in Jordan education is considered as an investment and students behave in accordance with the predictions of the economic theory.

However, linking the above the results reported in Table 8.1 and those reported in the previous chapter, concerning the influence of education on the magnitude of earnings expectations and in effect ERRs, indicates the possibility of endogeneity of ERR to post-secondary education decisions. In the previous chapter, education appeared to influence earnings expectations positively, showing also that those intending to continue

into HE to perceive substantially higher earnings and ERRs to HE. In effect, ERR, as an explanatory variable in the models shown in Table 8.1, is endogenous to HE decisions as much as vice versa. The problem of endogeneity is widely debated in the literature of RORs, unlike that of ERRs (see Chapter Four and Card, 2001). Instrumentation of ERRs, through finding an explanatory variable that is associated with ERRs and independent of education at the same time, would reveal better the influence of ERRs on the decision of staying on after the secondary education. However, this is not available in the current data set. This issue should be borne in mind in future research in the area of ERRs and their link with demand for HE.

The results of the logistic regression models in Table 8.1 also indicate a significant positive association between student ability and the probability of a student demanding HE. The odds ratio of the average marks variable is higher than 1 (around 1.130, which is significant at <0.001 in both models).

It has been common practice to control for student ability in the empirical analysis of student demand for HE, assuming a positive relationship to exist between the two variables. However, as discussed in chapters Four and Five, the exact relationship may vary according to differences in earnings expectations, implying a significant role for labour market conditions and the costs of education. The result obtained in the present analysis seems to be consistent with the predictions of the economic theory for the case of the Jordanian HE. A plausible explanation may be that students expected substantial ERRs for enrolment in HE as opposed to entering the labour market immediately after secondary education. Therefore, more able students are more likely to continue into HE since they encounter less risk of non-voluntarily dropping out of HE. This is because

more able students are expected to be more likely to graduate with the HE degrees which entitle holders to gain more returns in the labour market. Also, more able students may be more likely to enrol in HE due to supply-side effects which, in particular, favour more able students in being offered places in public HE institutions which charge relatively lower tuition fees.

8.3.3 The effects of family income and number of siblings

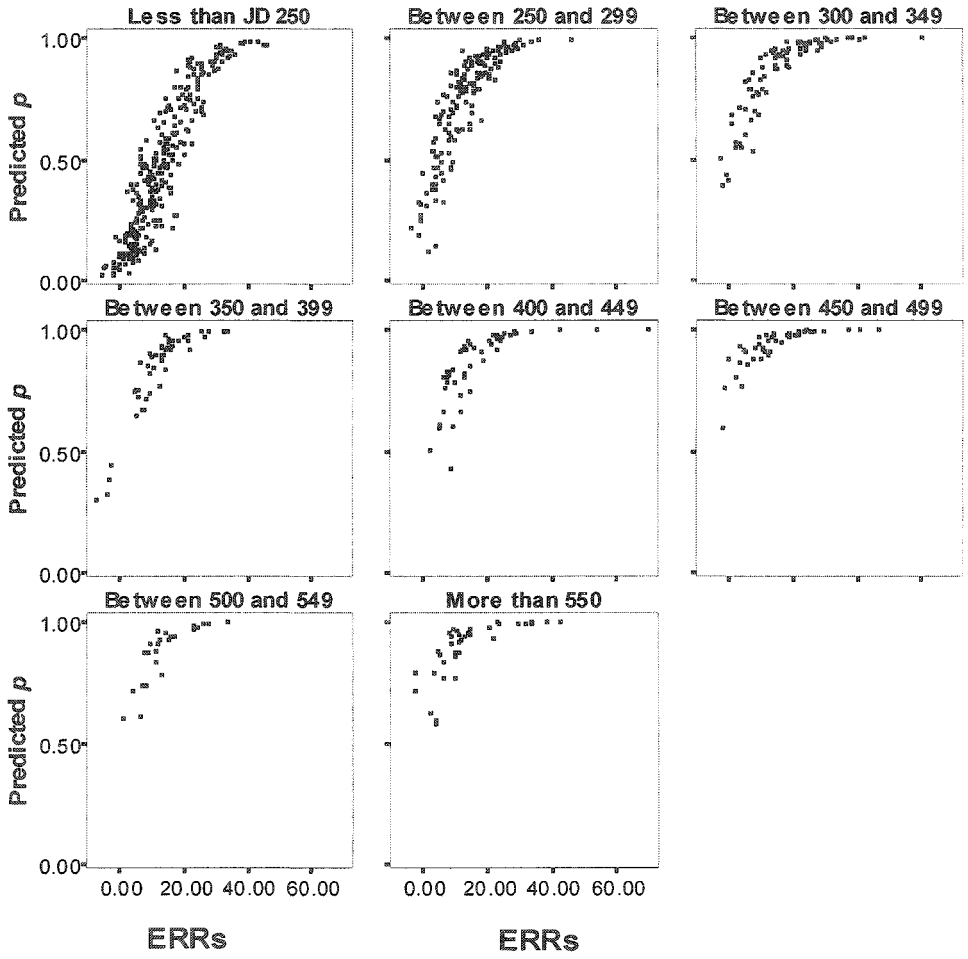
The family income variable represents the capital/budget constraints facing students and their families. In practice, this variable shows whether being from a lower-income family constrains students from participation in HE. The economic theory expects income to influence demand for education, regardless of whether education is a consumption or an investment activity. In terms of education as an investment good, income's role is hypothesized to be more influential when accessibility to student funds and loans is more difficult, as is the case in many developing countries. More precisely, the theory expects income to hinder students' investment in education only if their resources are not sufficient and borrowing against future earnings is imperfect. As student support schemes are weak in Jordan, one would expect income to exert an influential role in the function of the demand for HE, particularly for those from low-income families.

Results for the predictive influence exerted by income variable, as given in the basic and best models in Table 8.1, are to some extent consistent with the expectations of the economic theory. The coefficients (odds ratios) of income categories, which indicate the marginal effect of a category compared to the category that precedes it, indicate a significant impact for the second and third income categories. Those students from the

second income category (between JD250 and JD299) are found, in the two estimated models, to have a higher significant probability to plan to undertake HE relative to those from the lowest income group (less than JD250). Similarly, although with different significance levels between the basic and the best one, students coming from families with incomes ranging between JD300 and JD349 monthly are more likely to continue into HE compared with students from the lowest two income categories. The marginal effect of income beyond the third category then weakens as the coefficients attached to some of the upper income categories are insignificant, while some have also negative marginal effects. One potential reason for the observation of insignificant income effects beyond the lower three categories arises from the fact that education is tended to be considered as an investment at the individual level, as indicated above. Students form low-income families do expect to reap positive ERRs form HE but are not able financially to afford the cost of education. Therefore, they are less likely to opt for more education after the secondary education. After a particular level of income, any increase of income tends not to increase the probability of a student enrolling in HE.

Figure 8.2 provides a graphical depiction of the influence of income on the probability of student demand for HE as predicted by the best model. The figure obviously indicates that a considerable group of students from the lowest two income groups corresponded with a lower-than-0.5 probability of planning to continue into HE, after controlling for other variables including average of marks.

Figure 8.2: Predicted probabilities of student demand for HE by family income group (the best model)



Interestingly, the best model also demonstrates that number of siblings, which is directly linked to family income, is inversely associated with the dependent variable. This is furthermore consistent with the economic theory. Predictably, the odds ratio is less than unity and therefore suggests a negative relationship. Those from bigger families are on average less likely to participate in HE, regardless of family income. Of course, more siblings within a household lead to more competition for the household's resources and hence this may reduce the probability of enrolling in HE. Conversely, number of sibling undertaking HE education variable turns out not to be a significant determinant of the dependent variable when it is enforced into the estimation as in the

simultaneous model. According to the stepwise regression procedure this variable contributes negligibly to the prediction of the dependent variable and therefore removed from the best model. This suggests that family size matters more than the number of siblings undertaking HE.

The association of family income and family size with HE participation should draw the attention of policy makers regarding policies of promoting more equitable and efficient HE enrolment strategies (see next chapter).

8.3.4 The effects of student's area of residence and gender

According to the best model, male students in Jordan are somewhat more likely to plan to enrol in HE after the completion of secondary education (the odds ratio is 1.340 and significant beyond the 0.001 level). Policy makers in Jordan are more worried about gender gap in the labour market more than gender issues in HE as actually the gender gap in the latter is in favour of females, particularly in public HE institutions. However, the gender gap has decreased recently to become less than 3% (MOHE, 2005). In private university education, male students outnumber females by more than 5%. Therefore the result reported might reflect these recent developments and possibly represents more the situation in AlKarak area.

Having controlled for other variables, the contribution of the variation in area of residence on the prediction of the dependent variable (student demand for HE) is found to be insignificant (as in the simultaneous model). Statistically, this variable is found by the stepwise selection procedure as having no contribution to the prediction of the student demand for HE (see the best model). This finding is consistent with the role of

ERRs. The empirical analysis presented in Chapter Seven indicated that regional differences in ERRs were statistically weak.

As mentioned in Chapter Three, currently the policy adopted by the HEC distinguishes among students according to their schools. Those from the so-called disadvantaged schools are assigned a quota from the available places at the public HE institutions. Most of these schools are located in the nomadic and rural areas. The government argues that this strategy is required to enhance equitability of opportunities in HE provision, implying that academic achievements of urban students are on average better than those from non-urban areas. The result under investigation gives rise to the imperative question of whether such a quota needs to be revised. Actually, the present result found by logistic regression cannot be directly considered as undermining the current policy adopted by the HEC. Indeed, it may be the case that non-urban students took into account this policy and hence it had influenced their decisions/expectations concerning HE. In effect, this would grant support for the current strategy rather than opposing it. However, an investigation of the variables stimulating students' academic achievements can help in shedding more light on this issue. A recent study (Jarwan, 2001, see Chapter Five) shows that regional influences in academic achievement are negligible in Jordan. This can be re-examined using the data gathered in this study, which provides some variables that may help in understanding the potential role of area of residence in interacting with other variables to impact on students' academic achievements. However, as discussed in Chapter Five, there are a wide range of variables that may simultaneously manipulate student academic ability. The OLS regression model outlined in Table 8.2 which addresses the simultaneous effects of various variables on average marks which proxy for students' academic achievements,

is therefore suggestive. The table shows that the effect of area of residence is significant only in the case of the nomadic areas. This result is striking, as those studying in nomadic schools significantly outperform others in the rural and urban areas (β= 2.389, p< 0.01 level). The model, which is significant beyond the 0.01 level as indicated by F statistics, is associated however by a low value of R^2 (adjusted R^2 equal to 14.3%). Therefore, other important variables which may pertain to the within-school environment, such as class size, account for determining the students' academic achievement. To sum up, taking into account the results reported in Tables 8.1 and 8.2 and Jarwan (2001), it appears that urban students are not at an advantage compared with non-urban students with respect to their tendency to enrol in HE and to have better academic achievement. Policy makers may be well-advised to reconsider the current policy of enrolments to public HE institutions by establishing focused scientific research on the determinants of the academic achievements of students, and in particular regional influences.

Table 8.2: Simultaneous OLS estimation of students' average marks (N=708)

Variable*	Coefficient	**t-statistics	*p* value
(Constant)	72.963	47.54	0.000
Number of siblings	-0.33	-2.752	0.006
Sex (female=0)	-3.887	-4.656	0.000
Family monthly income (less than JD 250=0)			
≥JD 250 ≤ JD 299	2.94	2.813	0.005
≥JD 300 ≤ JD 349	-0.731	-0.567	0.571
≥JD 350 ≤ JD 399	2.783	1.729	0.084
≥JD 400 ≤ JD 449	1.626	0.995	0.32
≥JD 450 ≤ JD 499	3.233	1.843	0.066
≥JD 500 ≤ JD 549	4.469	1.994	0.047
≥JD 550	3.652	1.866	0.062
Area of residence (Urban=0)			
Rural	-0.688	-0.761	0.447
Nomadic	2.389	2.194	0.029
Father's education (Illiterate=0)			
Elementary	0.834	0.526	0.599
Basic (until Grade 10)	-0.335	-0.248	0.804
Secondary	2.298	1.609	0.108
I. Diploma	2.211	1.172	0.242
University and higher	2.675	1.483	0.138
Mother's education (Illiterate=0)			
Elementary	1.859	1.224	0.221
Basic (until Grade 10)	2.41	1.827	0.068
Secondary	0.089	0.073	0.942
I. Diploma	4.588	2.973	0.003
University and higher	6.646	2.787	0.005
Model Summary statistics:			
R^2	0.168		
Adjusted R^2	0.143		
F-statistics	6.599		
p value (F-statistics)	0.000		

*The variance inflation factor (VIF) values for all independent variables were less than 3. ** t values reported are based on white's Heteroskedasticity-consistent standard errors.

8.3.5 The effects of unemployment and labour market preferences

The literature lends some support to the effect of labour market conditions, particularly unemployment, in the determination of demand for HE (see Chapter Five). In essence, the labour market is directly related to decisions on education as it represents the catalyst through which people obtain returns to education. For example, the incidence of unemployment impacts on the opportunity costs and labour market returns to investment in education, leading to possible changes in individual education decisions over time and cross-sectionally. Also, as indicated in Chapter Two, it is argued that employment and education in Jordan are influenced by employment preferences amongst the youths.

This section utilises students' responses on a group of Likert-scaled statements to investigate the influence of the labour market on post-secondary education decisions. In the second part of the questionnaire, participants in the study were asked to rate their positions and perceptions on a number of statements using a response scale as follows: 5=fully applicable to me, 4=applicable to a great extent, 3= somewhat applicable, 2=applicable to a small extent, 1=not at all applicable. A mean score of 3 or above can be interpreted as the students tending towards the full applicability position. However, it is more important for the analysis of student demand for HE to examine the significance of inequality between means for the demand and employment groups, which was conducted using the non-parametric Mann-Whitney U test. Statements 1 through 5 in Table 8.3 show mean score per group on issues linked to the labour market in Jordan.

Table 8.3: Mean scores on five-point scaled statements measuring students' perceptions concerning HE and work

Statement	Mean (Demand group)	Mean (work group)
1. In my opinion, more education after the secondary stage helps in decreasing the period of time needed to get employed.	2.445 (1.335)	2.409 (1.305)
2. I believe that, even without higher education, I can get a good job.**	3.470* (1.478)	3.200* (1.557)
3. I do not mind working in socially-considered low-status jobs **	3.867 (1.127)	3.936 (1.169)
4. I like working in office jobs more than working in manual or vocational jobs.	3.385 (1.471)	3.359 (1.497)
5. I think my parents and relatives can help me in employment by utilising their social links.	2.459 (1.104)	2.277 (1.111)
6. My parents have considerable influence on my decisions about my future.	2.676 (1.388)	2.741 (1.499)
7. My teachers have influenced my post- secondary decisions.	2.254 (1.355)	2.314 (1.499)
8. My friends have influenced my decisions on the post-secondary education stage.	2.139 (1.357)	2.223 (1.408)
9. I believe that a student's HE life is enjoyable and interesting.	4.025 (1.448)	4.045 (1.137)
10. Socially, I perceive that people in Jordan give more respect to those bearing HE certificates.	4.268 (0.957)	4.205 (1.059)
11. In my opinion, being in HE benefits people socially by meeting new friends and learning new things about others' cultures.	4.377 (0.960)	4.218 (1.126)

Standard deviations are in parentheses.* Only the means of this statement are significantly different according to the non-parametric Mann-Whitney U test. ** These two statements were inversely recoded to be consistent with the scale applied for the other statements.

In terms of Table 8.3, statement 1 indicates that both groups of students (demand and employment) scored low on the notion that more education after the secondary education may lead to lower risks of unemployment. Actually, this perception accords with the actual pattern existing in the labour market, since unemployment is on average high among youths no matter what their education level. Although the demand group scored higher than the employment group, the difference between the two means is insignificant according to Mann-Whitney U test. This variable does not distinguish between the two groups and therefore tends not to impact on demand for HE. Statement 2 on the other hand indicates that students on average perceive that HE helps in obtaining better jobs in the labour market. Also, students belonging to the demand

group are found to score on average significantly higher than the other students. In effect, perceptions of the link between more education and better jobs can be considered as a significant variable in student demand for HE in Jordan.

Statements 3, 4 and 5 also evaluate additional aspects especially relevant to the labour market and education in Jordan (see Chapters Two and Three). One reason commonly put forward in interpreting the mismatch between education and occupations provided by the labour market is what is called in Jordan the 'shame culture'. This refers to preferences not to work in low-status jobs which typically require lower investment in education. Hence, the hypothesis implied is that students may demand more education to escape ending up in such jobs, even if this would expose them to longer periods of unemployment after graduation. Responses to statement 3 illustrate that this view is evident among both groups of students. The mean score is even higher, though the difference is not significant, among those intending to search for employment after secondary education. Students also scored similarly on statement 4 which is related to the previous statement. Several types of vocational and manual jobs in the labour market are occupied mainly by foreign workers, as they are not favoured by domestic job seekers. Labour market success in Jordan and developing countries is sometimes determined partially by non-market factors, such as corruption. In Jordan, a related argument raised occasionally by Jordanian public is the issue of '*Wasta*', which may incite individuals to continue/not continue into HE or particular HE specialisations. The *Wasta* phenomenon means subjecting the process of hiring employees to private links. From an economic theoretical point of view, the existence of family links (*Wasta*) in the labour market has no clear-cut effect in influencing student decisions on HE. The incidence of *Wasta* in the process of employment could encourage or discourage

students from undertaking HE or particular types of HE. Simply, a student with effective family links may choose to seek employment straightaway after the secondary school or choose to undertake HE due to their ability to possibly get employed more quickly after finishing a HE degree. Statement 5 qualitatively measures students' perceptions on such a feature, and shows that on average they perceive a lower (less than 2.5) role of family links in individual employment chances. This finding may be possibly attributed to the fact that family links are not effective for the majority of secondary school students. Collectively, the responses to the above three statements (3, 4 and 5) indicate that these types of social perceptions would tend not to affect students' post-secondary education decisions. Scores for both groups of students (demand and employment groups) were very similar and not statistically different. This finding supports the roles of ERRs and other basic variables as suggested by the economic theory and found in Table 8.1.

Some surprising results are reported in Table 8.3 regarding the students' perceptions on the role of the people around the students within households and schools. The responses indicate that the parents, teachers and friends of students exert relatively low influences on their post-secondary education decisions. This finding suggests that post-secondary education decisions are possibly made at the individual level rather than collectively, whether in the household or at school. Parents may be considered as a source of financial resources rather than as a means of information/advice on labour market and education. This pattern is similar to the findings reported above in Table 8.1 (the simultaneous model), which indicated that parents' levels of education were insignificant in influencing student demand for HE. The role of the parents, however, possibly may be much more influential in earlier educational stages. Given the

differences between the current study and that of Bani Essa (1995) in terms of methodology (since the current study controls for ERRs) a direct comparison between the two studies would be somewhat difficult. However, the difference between the two studies regarding the role of the parent's level of education might have resulted from the fact that ERRs are controlled for in this study. Alternatively, the role of parent's education might have been gradually replaced by the role of family income, given the increases in HE costs and living expenses that have occurred in Jordan since 1994.

8.3.6 The effects of the consumption value of education

The view that education is an investment dominates modern economic theory as mainly represented by HCT. However, theory does not deny that education might be considered as a consumption activity as well. This of course has implications for policy making and for the computation of ERRs. Statements 9, 10 and 11 in Table 8.3 were designed to evaluate students' perceptions on the consumption value of HE. In statement 9 students were asked to rank their opinion on the view that HE is enjoyable and interesting. In statement 10, they were required to respond similarly regarding the view that education is associated with better social prestige and respect. Finally, in statement 11, consumption benefits are detected through asking students about the social and cultural benefits of education in terms of meeting new friends and gaining new opportunities for socialising with others. The mean scores of responses to these statements are relatively high, at an access of 4.0. This suggests high perceptions of the consumption value of HE. Yet, this pattern is observed for both groups, meaning that the whole sample on average perceive a notable consumption value of education in society. Accordingly, while measured ERRs may suffer from downward bias due to an omission of consumption benefits, consumption motives turn out to be insignificant variables in

discriminating the demand group from the employment group. From a theoretical point of view it is cannot be denied that education has a considerable consumption value. What one can refute at this stage is the predictive role of consumption motives in differentiating those undertaking HE from those not.

8.4 Conclusion

The purpose of this chapter has been to gain insights into the factors influencing student demand for HE in Jordan. Analytically, the chapter has drawn heavily on logistic regression techniques due to the dichotomous nature of the dependent variable. The analysis used various information culled from respondents through the questionnaire survey. Moreover, the logistic estimation applied the ERRs variable generated in the analysis of earnings expectations conducted in Chapter Seven.

The most general interesting finding found in this chapter was that HE is individually considered as an investment good. The empirical analysis captured a substantial positive influence of ERRs, supporting the hypothesis from economic theory that investment motives determine individual education decisions. Apart from Dhesi (2001), this finding is in line with the previous studies in this area (Hung et al, 2000; Menon, 1997a; Varga, 2002). Overwhelmingly, the latter studies, have found that students' plans/decisions to opt for HE education are strongly and significantly influenced by the returns perceived or expected by them at secondary education level, even after controlling for family background and personal variables.

As predicted, family income and student ability were also found to be significant underlying positive determinants of demand. Those from the lowest-income families

were estimated to be less likely to plan to continue into HE as compared to their counterparts from higher-income families, when other variables were held constant. Gender and number of siblings in a household were also significant variables. Male students were predicted to be more likely than females to decide to enrol in HE after secondary education. On the other hand, an increase in family size, as approximated in sibling numbers, reduces the probability of a student enrolling in HE. Conversely, although consumption motives were strongly perceived among the students, these appear not to be among the significant variables influencing of student demand for HE. This variable, however, is important for the calculation of ERRs, which may be downwardly biased.

More education was considered by the students to enhance their prospect to obtain better jobs, but not to result in decreasing the time needed for someone to get employed after graduation.

With regard to student's area of residence, the empirical findings reported in this chapter granted a weak effect for such a variable on student demand for HE. An OLS regression was also conducted to look at whether the latter variable intervened in shaping students' average marks (which is assumed to proxy for student ability). According to this estimation, those from urban areas are not at an advantage in comparison with non-urban students. This result is in line with findings reported in a recent education-based study (Jarwan, 2001). This, in turn, clearly indicates support for present claims concerning the necessity to revise the system adopted in Jordan for enrolment to HE public institutions.

In the following chapter, the main findings of the study will be shown. It will further present the conclusions of the study and offer some policy recommendations regarding HE in Jordan.

1 As in the case of the analysis in Chapter Seven, the significance level ("p-value") for entry or removal from the models was set at 0.15.

CHAPTER NINE

CONCLUSIONS AND RECOMMENDATIONS

9.1 Introduction

Economists have long recognised the significance of student demand for higher education (HE), particularly after the emergence of the Human Capital Theory (HCT) in the early 1960s. Theoretically, modern economic theory, as mainly represented by HCT, considers individual expenditure on education as an investment in human capital that will generate returns in the future over the working lifetime. Students are considered as well-informed agents, whose education decisions are supposed to be taken rationally. Therefore, earnings expectations as subjectively perceived by students on the verge of making educational and occupational decisions lie at the heart of the economic theoretical interpretation of student demand for HE (Webbink & Hartog, 2004). Despite this fact, direct empirical investigations of this relationship have been relatively scant. Instead, the norm has been to rely on earnings realisations to proxy for earnings expectations (Varga, 2002).

Regarding the literature pertaining to examining demand for HE in Jordan, the research as a whole is underdeveloped and scarce. There has been only one study conducted in one of Jordan's northern areas (Bani Essa, 1995). The latter study, however, did not take into account the role of earnings expectations perceived by secondary school students.

The present research has been directed towards contributing to the study of student demand for HE in Jordan, using for the first time earnings expectations elicited from a sample of final year secondary education students from AlKarak governorate. Furthermore, it contributes to the literature on the return to education in Jordan, which is similarly sparse, via calculating expected rates of return (ERRs) to HE, employing the short-cut method. The study, moreover, involves examining individual differences in ERRs and starting earnings expectations and the latter's deviations from actual public sector starting earnings.

In addition to starting earnings expectations for secondary education and HE, the research via a questionnaire survey has collected data on various factors relevant to examining students' education decisions. A central question tackled in the questionnaire concerned post-secondary education decisions. Each respondent was asked to report their *most likely post-secondary stage decision* (i.e. to continue into HE or to search for employment). Students' responses on this question served as a proxy for student demand for HE and allowed the categorisation of students into two distinct groups (the demand group vs. the employment group).

The thesis is structured around nine chapters. In the first, the study is introduced. This includes setting out the main and secondary objectives of the research. In Chapter Two, a general overview of the Jordanian economy, including the labour market, is given. Chapter Three introduces Jordan's education system and provides a descriptive times-series analysis of demand for HE in Jordan, which has apparently increased over the last two decades. The economic theoretical interpretation of student demand for HE is considered in Chapter Four. This also includes discussing and conceptualising the costs

and benefits of education and methods of measuring (RORs) to education. The empirical literature on student demand for HE and earnings expectations, on the other hand, is reviewed in Chapter Five, while Chapter Six tackles the methods and methodology used in the study. The empirical analysis of the data collected is carried out in Chapters Seven and Eight. In the former, short-cut ERRs are calculated based on starting earnings expectations, which are also analysed to examine differences in earnings expectations across gender and students' areas of residence and to evaluate whether or not students base their expectations on prevalent wage rates. Using primarily logistic regression techniques, Chapter Eight examines student demand for HE and its endogeneity to ERRs. Finally, the present chapter seeks to draw the main conclusions of the study. Furthermore, it presents recommendations for improving policy making on student demand for HE, ending with some suggestions for further research in this area.

9.2 Main findings

- **Education is the main driving force of students' earnings expectations:**

In line with the vast majority of studies on earnings expectations, the analysis showed that there was a strong significant relationship between intended education levels and expected starting earnings in Jordan. There was a common perception that HE results in positive earnings differentials, suggesting that students on average perceive the link between more education and more earnings, irrespective of gender and regional differences. Theoretically, this in turn might impact on students' decisions on the post-secondary education stage, which was itself empirically evident (see below).

➢ **Females expect to earn less, irrespective of education level:**

Consistent with the overall prevailing conditions in Jordan's labour market and the literature in this area, female students were found in this study to expect lower starting earnings than males on average. In particular, this pattern was stronger for employment with secondary school than with HE, implying that males perceive higher opportunity costs as opposed to females. In turn, this fact impacted on the calculation of ERRs, which proved to be significantly different across gender.

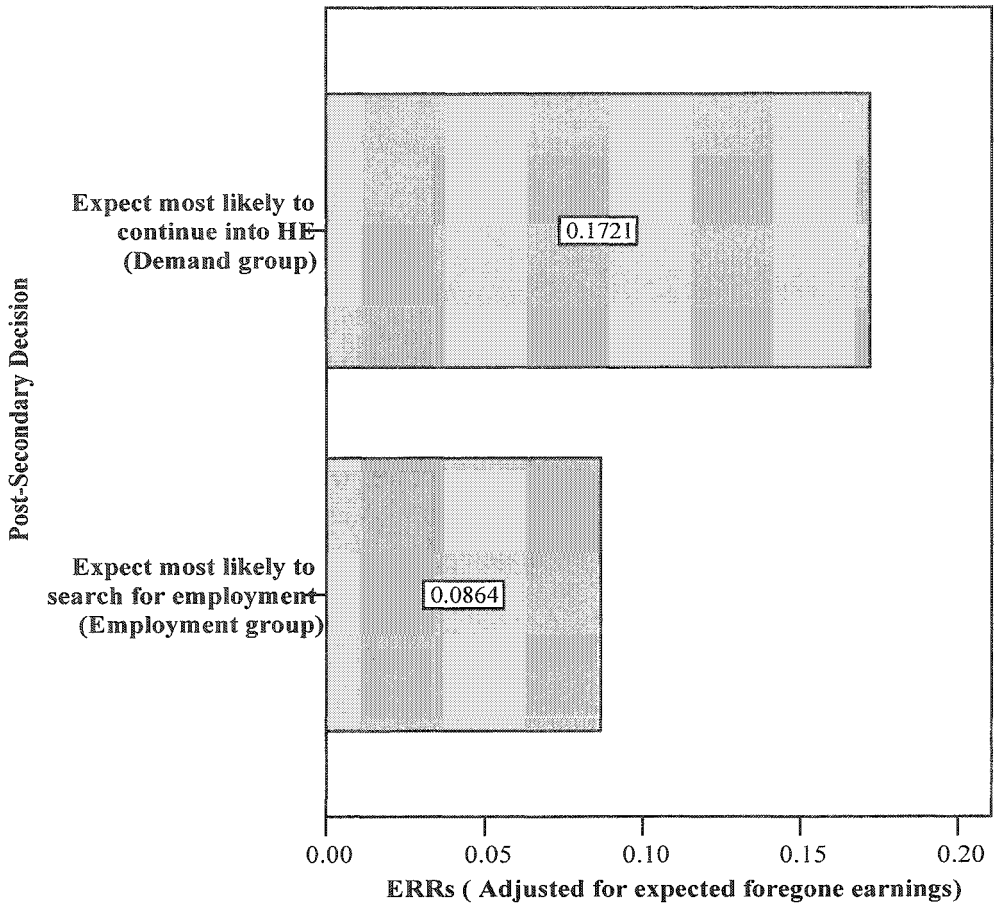
Other variables related to the educational levels of students' parents and family income showed weak associations in terms of differentiating students' starting earnings expectations. The evidence produced in the analysis also granted little impact of student academic ability. The area of residence variable, in contrast, was identified to have some impact on students' earnings expectations in the case of both secondary education and HE.

➢ **ERRs differ significantly across gender and post-secondary education decision**

ERRs to HE were measured according to the short-cut method, which relied upon expected starting earnings and measures of direct costs of HE to compute returns to education. ERRs were calculated both with the inclusion of only the expected opportunity costs, and further with added measures for tuition fees charged at HE institutions. These two types of ERR both turned out to be positive and varied significantly with gender and HE specialisation, but not significantly with student's area of residence. Females' average expected rate of return to HE was 15.6%, exceeding significantly that of males by around 2.8% in the case of including merely the opportunity costs. This declined to 10.1% in the case of adjusting the calculation for the

direct cost of HE by including measures of tuition fees. In the same way, ERRs in this case declined for males and stayed lower than those of females by around 1.35%. ERRs were further measured for each HE field group. Preferred HE fields or specialisations were grouped into eight distinct groups based on the public sector earnings system. In general, students appeared to expect ERRs that were consistent with public sector earnings differences. For example, those students preferring to enrol in the medical sciences were proved to expect the highest return, while community college education was expected to return the lowest rate, in the case of not considering HE tuition fees. Of course, the adjustment for tuition fees decreased the measured rates and changed the rankings among HE field groups as well.

Figure 9.1: Mean short-cut expected rates of return (ERRs) to HE by post-secondary education decision



Interestingly, as summarised in Figure 9.1, students intending to continue into HE were found to expect substantially and significantly higher ERRs than their counterparts preferring to enter the labour market after secondary education. This finding is similar to the trends found in earlier studies (Hung et al, 2000 and Menon, 1997a). Such a difference in expected returns, of course, resulted from individual differences in expectations on the gains for HE, and implies on average a relationship between the decision to continue into HE and ERRs. This relationship was further examined using logistic regressions of student demand for HE (see below).

- **Students are overoptimistic and tend not to rely on prevailing wage rates in their earnings expectations:**

Several patterns appearing in the analysis showed that students tend to know about the earnings prevailing in the labour market. For example, students expect females to earn less and anticipated that HE would result in higher earnings. When compared with actual public sector earnings, students' elicited earning expectations for HE field groups showed analogous ranks. For instance, the medical sciences were expected to result in the highest starting earnings followed by dentistry and then engineering. On the other hand, those preferring to enrol in the community college education reported the lowest expected earnings.

However, two important points deserve intention here:

1. For both secondary education and HE, students appeared to noticeably expect higher starting earnings than those currently prevailing in the public sector, which is the biggest employer in the country. This finding is different from that reported in Carvajal et al (2000) and Wolter (2000), who both, however, applied different approaches (see Chapter Five). The measured ERRs were also shown

to be higher than RORs estimated in the latest related study in Jordan (Talafeh, 2003)

2. Earnings expectations possessed by the students tended to be overoptimistic, given the current economic conditions characterising the Jordanian economy.

- **Student demand for HE is strongly and positively influenced by ERRs and student academic ability:**

As set out in both Chapters One and Three, student demand for HE has increased in Jordan, despite the high unemployment characterising the economy. The empirical analysis conducted in Chapter Eight used logistic regression techniques to examine why students demand HE and what the effects of ERRs are on the latter. The logistic analysis involved fitting three models. Firstly, a model that tests the prediction power of the basic variables (ERRs, family income and native ability of students (averages of marks)) was carried out. Secondly, a model examining the simultaneous influence of the basic predictors and other variables suggested by the literature was fitted. To arrive at the best set of variables that predict student demand for HE in Jordan, a stepwise logistic regression procedure was finally applied.

The three models found that ERRs were major determinants of student demand for HE. A substantial positive influence of ERRs was reported, supporting the hypothesis from economic theory that investment motives determine individual education decisions. Apart from Dhesi (2001), this result is consistent with the previous studies in this area (Hung et al, 2000; Menon, 1997a; Varga, 2002). These studies have produced overwhelming evidence that students' plans/decisions to opt for HE education are strongly and significantly influenced by the returns perceived or expected by them at

secondary education level, even after controlling for family background and personal variables.

Consequently, the empirical analysis supports the notion that secondary students in Jordan behave in accordance with the prediction of economic theory, as mainly represented by HCT, since higher ERRs are predicted to increase the probability of considering enrolment in HE.

The evidence that ERRs influence student demand for HE in Jordan suggests that earnings expectations perceived by secondary students are important for policy makers, particularly for predicting the demand. However, as mentioned above, students tended not to be well-informed about the benefits of HE. As a result, overestimation of the benefits of HE may prevail among secondary education students, possibly leading to increased demand for HE and contributing to the mismatch problem between education and labour market in Jordan.

In line with most of the studies on demand for HE, student academic achievement turned out to be a significant factor in student demand for HE in Jordan. More able students were found more likely to plan to enrol in HE. However, students from low-income families, including high-ability students, were estimated to have a lower likelihood of considering participation in HE (see below).

- **Students from higher-income families are more likely to demand HE:**

Family income, which is of particular importance from a policy perspective, significantly influences student demand for HE as found by the logistic regression.

Nevertheless, this influence appear to be most important for those from the lowest two income categories, while those from the higher income families turn out to be only weakly affected by income constraints. Furthermore, those from large families in terms of number of siblings are less likely to consider continuing into HE. These are therefore two key factors for equity and efficiency of policy making on HE in Jordan (as discussed below in 9.3).

Unlike family income, area of residence showed no significant relationship with demand. The analysis also indicated that this variable was also only weakly correlated with student academic achievement.

- **Consumption values of HE are clearly perceived but tend not to affect demand:** Students' perceptions on the consumption motives of education were also examined. Although unequivocally perceived, consumption value of education tended to play a weak role in differentiating demand group from the employment group. Using Likert-scaled statements, regardless of their post-secondary decision, students on average were found to place a high value on the consumption benefits of education. This result is, however, important for the ERRs calculated in this study and for future research in Jordan. Equally, it is of great relevance for RORs studies. The measured returns for HE using both methods might thus suffer from downward bias, and this should be taken into account in future research.

9.3 Recommendations

Based on the empirical analysis in the study and the present policy concerning HE in Jordan, several recommendations can be suggested to improve the efficiency and equity

of HE policy and its links with the labour market in Jordan. In this section some considerations with reference to both efficiency and equity are considered in turn.

9.3.1 Efficiency considerations

- **Towards better information systems on the labour market and HE:**

The study shows that students tend to overestimate the pay-offs of HE. This phenomenon might contribute to a mismatch between education and labour market. Therefore, more accurate information on HE fields, their employment opportunities, and their labour market returns should be at the heart of policy to help in alleviating distortions in individual education decisions. Career guidance and counselling programmes should be a common place component of policy in secondary schools and not only at universities as currently practised. This may help in encouraging more efficiency at the microeconomic level by making students more informed about work and HE.

- **Towards more and better use of RORs analysis in policy making:**

The field of studying RORs to education and to HE is underdeveloped in Jordan, and, in effect is not used in decision making. Therefore, the present findings in general point to the need to regularly conduct publicly-funded research on social and private RORs for the purpose of improving the efficient use of public resources in education and HE. It is advised that this should run in parallel to studies of ERRs and the accuracy of earnings expectations. A part of the empirical analysis in this study shows that students seem not to rely on the current prevailing public sector wages in constructing their earnings expectations. The analysis indicates that they may base their expectations on future earnings, albeit overoptimistically. This suggestive evidence should be borne in mind if

policy makers apply RORs in forecasting demand for education and HE. Nevertheless, further focused research on the accuracy of earnings expectations is certainly necessary.

- **Towards more sufficient and efficient schemes of student financial support:**

The findings of the study broadly show that none of the family background variables, except for family income, significantly impact on students' decisions to enrol in HE. Accordingly, the study supports the present rules of the newly introduced student support fund, which considers only family income as a family background variable in determining the eligibility of a student to receive public financial support. However, it may be more efficient to consider also family size or number of siblings in such a criterion. Better efficiency could probably be attained if the policy also took into account the HE specialisation a student planned to take. In other words, those fields of HE expected to result in higher social returns and less wastage in terms of unemployment or underutilisation should receive more attention and public resources. However, as indicated above, this would require the availability of data from regular investigations of social and private RORs to HE.

The study indicates that students from low income families, regardless of their academic abilities, are much less likely to consider undertaking HE. In addition to equity considerations (see below) this implies that public resources directed to HE may currently exclude high-ability students from HE due to financial constraints. According to the economic theory, high-ability students are expected to more efficiently build and use human capital. In this regard, the findings of the study support the very recent policy of shifting more of the costs of HE towards students coupled with redistributing more resources towards poor students.

Finally, the present resources for student funding are undoubtedly in all senses insufficient (Alfanek, 2004). This gives emphasis to the need to reallocate more public resources towards HE, given the comparative importance of human resources for the Jordanian economy. The criteria used in student fund require eligible students to apply on a termly basis to renew their support. However, it is not guaranteed that financial assistance will be obtained again. Also in most cases, the fund provides only partial coverage of the costs of education and is likely to subject some students to the risk of non-voluntarily dropping out of HE. This would be an inefficient use of public funds as well a wastage of private resources. The current financial market is also substantially weak in providing students loans, particularly for those from low-income families who possess no capital or assets to guarantee loans apart from their future investment in human capital. Therefore, it would perhaps be wise now to consider establishing an income contingent loan scheme to help in funding HE. The latter policy would work more efficiently in Jordan, as an Islamic society, if it is applied according to the Islamic law.

9.3.2 Equity and equality of access considerations

Increasing and broadening HE participation increases the stock and improves the distribution of human capital in a society. The education of disadvantaged societal groups is widely considered as a central method of alleviating poverty and combating social inequality through mainly labour market mechanisms. However, this depends entirely on labour market conditions. When more public investments in HE for unprivileged students are coupled with higher unemployment or underutilisation of HE degrees, public resources will be inefficiently used and might not contribute much to improving the socio-economic conditions of the poor. Therefore, it may seem unwise to

aid a poor student with public resources to study in an HE field characterised with a high probability of being unemployed or ending up in a job requiring fewer skills. In effect, one would suggest here that any policy to enhancing equality of access to HE in Jordan should look at whether such a policy plays the appropriate role as a mechanism for combating poverty and redistributing income. The study's findings show that those from low-income families are less likely to opt for more education after secondary education. Therefore, as the resources available for the new student fund are insufficient, more resources should be devoted to the education of high-ability poor students and particularly those enrolling in specialisations of priority to the economy. This could enhance both the equity and efficiency of using public resources in this sector. In a related vein, the results of the present study suggest that the policy adopted by the Higher Education Council (HEC) might be inadequate with respect to offering HE enrolment quota for students in schools in rural and nomadic areas. The present quota system is possibly part of the problem rather than a way of solving it. It seems feasible to revise this policy by establishing further national interdisciplinary scientific research on the real determinants of student academic achievement and whether a school's location actually has an impact in this process.

9.4 Future research

Further studies are valuable in the field of students' earnings expectations and their influence on student demand for education and HE, since this area as a whole has received little consideration. A deeper investigation of individual expectations on various relative earnings of HE subjects is a worthwhile endeavour. It would grant better understanding of education decisions on HE and their endogeneity to ERRs.

The present thesis has produced evidence on the influence of many variables on student demand for HE in Jordan. However, there is a need to incorporate other potentially important variables, notably more measures on student ability. Recently, the MOE has initiated a promising programme involving saving exam marks of the students in the pre-HE system. This database will provide more reliable measures of students' academic ability which can be used in future research on demand for education and the determinants of academic achievements.

In Jordan, a potentially promising avenue for future research in the area of demand for HE would be to examine not only demand on average, but also by subject area and type of institution (i.e. private or public). This would allow more and deeper insights to be gained into the determinants of demand for HE specialisations and institutions. However, this would require more diverse data on relative earnings expectations per student to be collected. Also, the number of Jordanians enrolling in HE abroad remains high. This phenomenon requires an empirical examination of the antecedent variables of demand for foreign HE by Jordanians.

In general, the areas of RORs and ERRs in Jordan necessitate systematic investigation, especially over time, to facilitate better policy making as regards student demand and the public supply of HE. Future research on RORs in Jordan should also take into account what is known in the literature as the 'ability bias'. The available studies have used the standard Mincerian method, which might overestimate the return to education and HE due to the negligence of the role of ability and potential interrelationships among ability, schooling and family background factors. Finally, by incorporating realised data on earnings profiles for both the private and public sectors, further research

on accuracy and realism of earnings expectations in Jordan's labour market represent a fruitful area of investigation for academic and policy making purposes.

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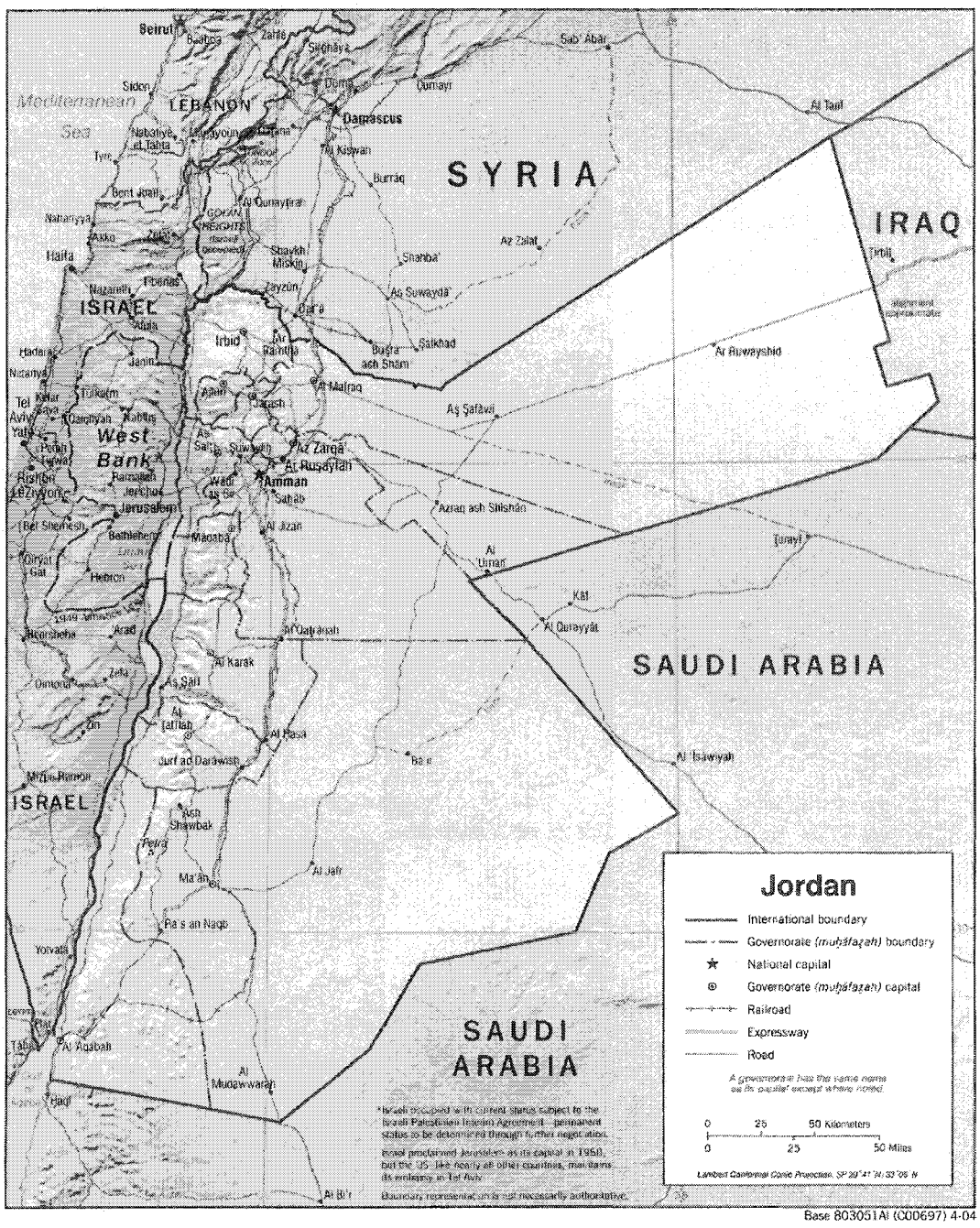
APPENDIX 1
Political and Administrative Map of Jordan



Source: *http://www.lib.utexas.edu/maps/middle_east_and_asia/jordan_rel_2004.jpg*
(Retrieved on 17/02/2006)

APPENDIX 2
Questionnaire for secondary school students
(Arabic version)

عزيزي الطالب/ اختي الطالبة

الاستبيان الذي بين يديك هو جزء مهم من دراسة يقوم بها الباحث إبراهيم الهوا رين حول العوامل المؤثرة في الطلب على التعليم العالي في الأردن: وجهة نظر اقتصادية. يهدف الاستبيان بشكل رئيسي لجمع بعض المعلومات المتعلقة بطلب الأفراد للتعليم العالي و العوامل المؤثرة فيه.

إن المعلومات المراد الحصول عليها من خلال هذا الاستبيان مهمة جدا للدراسة وهي سوف تستعمل لأغراض البحث العلمي المتعلقة بهذه الدراسة فقط. لذلك فان إجابتكم الصحيحة و الصادقة هي ذات أهمية كبيرة و لها بالطبع التقدير الكبير من الباحث ومن جامعته. لذلك يتمنى الباحث بكل تقدير أن تقوموا بإجابة الأسئلة حسب التعليمات المرفقة مع كل سؤال.

إن الاستبيان يتصف بأنه لا يتطلب منكم أن تضعوا أسمائكم على أي جزء منه. و بالنتيجة أيضا فان أي معلومة تقدمونها خلال الاستبيان سوف تعامل بسرية كاملة و لن يطلع عليها أي شخص أخر غير الباحث. المشاركة في هذا الاستبيان هي اختيارية ويمكنك أن تنسحب من المشاركة في أي وقت تشاء بالإضافة إلى حقك في عدم الإجابة على أي سؤال قد لا تفضل الإجابة عليه. يجب التنويه هنا أن الاستبيان يتكون من ست صفحات .

خلال عملية الإجابة أو بعدها إذا كان لديك أي تعليق أو ملاحظة فالرجاء كتابة ذلك على ظهر أخر صفحة من الاستبيان أو إبلاغ الباحث بذلك و لكم جزيل الشكر.

الباحث
إبراهيم محمد الهوا رين
جامعة نورثامبريا-نيوكاسل/المملكة المتحدة
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الجزء الأول: يتكون من (٨) أسئلة

في هذا الجزء نود أن نعرف بعض المعلومات العامة عنك. بعض الأسئلة تحتاج منك فقط أن تؤشر على مربع الإجابة المناسبة لك (هكذا ✓). بعض الأسئلة الأخرى في هذا الجزء تحتاج منك ا ن تضع إجابتك في الفراغ المرفق مع كل سؤال.

(١) **ما هو جنسك ؟** ١. ☐ ذكر ٢. ☐ أنثى

(٢) **ما هو فرعك الثانوي ؟** ١ ☐ علمي ٢ ☐ أدبي ٣ ☐ إ. معلوماتية

(٣) **كم كان معد لك في الفصل الدراسي السابق (امتحان الوزارة) ؟** كان .....%

(٤) **ما هو المستوى التعليمي لوالدك؟** ١ ☐ أمي ٢ ☐ إبتدائي ٣ ☐ أساسي

٤ ☐ ثانوي ٥ ☐ دبلوم متوسط ٦ ☐ جامعي فما فوق

(٥) **ما هو المستوى التعليمي لوالدتك؟** ١ ☐ أمي ٢ ☐ إبتدائي ٣ ☐ أساسي

٤ ☐ ثانوي ٥ ☐ دبلوم متوسط ٦ ☐ جامعي فما فوق

(٦) **كم من الاخوة و الأخوات لديك؟** عدد الاخوة .....

عدد الأخوات.....

(٧) **كم من إخوتك و أخواتك يدرس حاليا في التعليم العالي (كليات مجتمع و جامعات)؟**

عدد الاخوة الذين يدرسون حالياً في التعليم العالي.....

عدد الأخوات اللاتي يدرسن حالياً في التعليم العالي.....

(٨) **تقريباً ما هو الدخل الشهري لعائلتك؟**

١. ☐ اقل من ٢٥٠ دينار شهري ٢. ☐ ما بين ٢٥٠ و ٢٩٩

٣. ☐ ما بين ٣٠٠ و٣٤٩ ٤. ☐ ما بين ٣٥٠ و ٣٩٩

٥. ☐ ما بين ٤٠٠ و ٤٤٩ ٦. ☐ ما بين ٤٥٠ و ٤٩٩

٧. ☐ ما بين٥٠٠ و٥٤٩ ٨. ☐ اكثر من٥٥٠

الجزء الثاني: يتكون من (١١) جملة

هذا ا لقسم يتكون من احدى عشر جملة تعبر عن بعض الاراء والاوضاع الاجتماعية و الاقتصادية. الرجاء تحديد الى أي مدى كل جملة تنطبق عليك وذ لك باختيار احدى الخيارات المتاحة مقابل كل جملة (منطبقة عليّ تماماً, منطبقة عليّ الى حد كبير, منطبقة عليّ إلى حد متوسط , منطبقة عليّ الى حد قليل , غير منطبقة عليّ تماما). الرجاء اختيار التاشير على خيار واحد فقط

	منطبقة عليّ تماماً	منطبقة عليّ الى حد كبير	منطبقة عليّ إلى حد متوسط	منطبقة عليّ الى حد قليل	غير منطبقة عليّ تماماً
(٩)في اعتقادي التعليم في مرحلة ما بعد التوجيهي يساعد في تقليل الفترة الزمنية اللازمة لحصول الفرد على وظيفة أو عمل.	☐	☐	☐	☐	☐
(١٠)أنا اعتقد انه حتى بدون تعليم عالي, أنا باستطاعتي الحصول على وظيفة جيدة.	☐	☐	☐	☐	☐
(١١)ليس لدي أي مانع من العمل في بعض الأعمال التي تعتبر اجتماعيا عيباً	☐	☐	☐	☐	☐
(١٢) أنا بطبعي افضل الأعمال المكتبية اكثر من العمل في الأعمال اليدوية أو المهنية	☐	☐	☐	☐	☐
(١٣) أنا اعتقد أن باستطاعة والداي و أقربائي أن يساعدوني في الحصول على وظيفة جيدة بعد إكمالي لدراستي.	☐	☐	☐	☐	☐
(١٤) إن لوالدي دوراً كبيراً في صناعة قراراتي حول مستقبلي	☐	☐	☐	☐	☐
(١٥) إن للمعلمين في مدرستي اثر بالغ في قراراتي حول مرحلة ما بعد الثانوية	☐	☐	☐	☐	☐
(١٦) زملائي لهم دور في التأثير على قراراتي حول مرحلة ما بعد الثانوية	☐	☐	☐	☐	☐
(١٧)أنا اعتقد انه من الممتع أن يدرس الفرد في إحدى الجامعات أو كليات المجتمع.	☐	☐	☐	☐	☐
(١٨)إجتماعياً, أنا المس أن الناس في الأردن يعطون احتراماً وتقديراً اكثر للأشخاص الذين لديهم شهادات تعليم عالي	☐	☐	☐	☐	☐
(١٩)في اعتقادي أن الطالب في الجامعة أو الكلية يستفيد اجتماعياً و ثقافياً من خلال الاختلاط مع أناس جدد و مقابلة أصدقاء جدد	☐	☐	☐	☐	☐

الجزء الثالث: يتكون من سؤال واحد

(٢٠) ماذا تتوقع أن تكون خطوتك التالية بعد إنهاءك لهذه ا لمرحلة التعليمية (التوجيهي). اختار من الخيارات التالية الخيار الأكثر احتمالية و الذي تتوقع أن تسلكه بناءاً على وضعك الدراسي و الاقتصادي:

١ . ☐ بعد إكمالي لهذه المرحلة سوف اكمل دراستي في مؤسسات التعليم العالي

٢ . ☐ بعد إكمالي لهذه المرحلة سوف أسعى للحصول على عمل

٣. ☐ أخرى: الرجاء التحديد.....

إذا كانت إجابتك على السؤال هي(١) الرجاء الإجابة على الجزء الرابع فقط
إذا كانت الإجابة هي (٢) الرجاء الانتقال إلى الجزء الخامس و عدم إجابة الجزء الرابع
إذا كانت الإجابة هي (٣) الرجاء تسليم الاستبيان الآن

الجزء الرابع: يتكون من (٨) أسئلة

حيث انك تتوقع انك سوف تكمل دراستك في إحدى مؤسسات التعليم العالي , نود أن نسألك بعض الأسئلة حول تخصصات التعليم العالي:
(٢١) ما هو اكثر التخصصات الذي ترغبه؟
أنا ارغب دراسة.....

(٢٢)اين تريد ان تدرس تخصصك المفضل (الرجاء تسمية المؤسسة سواء ا كانت كلية او جامعة)؟
.....

ادا كنت ترغب في الدراسة في احدى الجامعات الخاصة الرجاء عدم اجابة السؤال٢٣ و الانتقال الى السؤال ٢٤

(٢٣) إذا كنت ترغب في الدراسة في إحدى الكليات أو الجامعات الحكومية, ماذا سوف تعمل في حالة انك لم تحصل على فرصة دراسية في التخصص الذي ترغب؟ المطلوب التأشير على إحدى الإجابات التالية:

١. ☐ سوف اقبل أن ادرس بعض التخصصات الأخرى المتاحة في الجامعات أو الكليات الحكومية

٢. ☐ سوف ادرس تخصصي المفضل في إحدى الجامعات أو الكليات الخاصة

٣. ☐ سوف ادرس تخصصي المفضل في الخارج

٤. ☐ أخرى (الرجاء التحديد بإختصار) :.....

(٢٤) ما هي الوظيفة التي ترغب أن تعمل بها بعد أن تحصل على التعليم العالي الذي ترغب؟

أود أن اعمل.....

(٢٥) هل ترغب بالعمل في القطاع العام ام القطاع الخاص؟

١. ☐ القطاع الخاص

٢. ☐ القطاع العام

(٢٦) **حيث انك تتوقع انك سوف تكمل دراستك في إحدى مؤسسات التعليم العالي, افرض انك حصلت على عمل بعد حصولك على التخصص الذي ترغب فيه, ماذا تتوقع أن يكون راتبك الشهري الإجمالي بعد التعيين:**

أول راتب إجمالي بعد التعيين: أتوقع أن يكون حوالي.....دينار شهريا

(٢٧) **افرض انك لم تكمل تعليمك بعد التوجيهي و حصلت على عمل مباشرة بعد التوجيهي , ماذا تتوقع أن يكون راتبك الإجمالي بعد التعيين بالمتوسط شهريا:**

أول راتب إجمالي بعد التعيين: أتوقع أن يكون حوالي.....دينار شهريا

(٢٨) **من فضلك اخبرنا كم من الوقت قد تحتاج للحصول على عمل اذا قمت بالبحث عن عمل بعد حصولك على التخصص الذي ترغب؟**

١. ☐ لن احتاج الى اي وقت

٢. ☐ قد احتاج الى وقت قصير

٣. ☐ قد احتاج الى وقت متوسط

٤. ☐ قد احتاج الى وقت طويل

٥. ☐ قد احتاج الى وقت طويل جدا

الجزء الخامس: يتكون(٤) أسئلة

(٢١) **حيث انك تتوقع أن تكون خطوتك التالية هي عدم إكمال دراستك بعد التوجيهي و ترغب بالبحث عن عمل, ما هو العمل أو الوظيفة الذي ترغب أن تعمل به أو بها بعد التوجيهي:**

أود أن اعمل.....

(٢٢) **هل ترغب بالعمل في القطاع العام ام القطاع الخاص؟**

١. ☐ القطاع الخاص

٢ ☐ القطاع العام

(٢٣) حيث انك تتوقع انك سوف لن تكمل دراستك بعد التوجيهي و انك سوف تبحث عن عمل, افرض انك حصلت على عمل بعد التوجيهي مباشرة ماذا تتوقع أن يكون راتبك الشهري الأجمالي بعد التعيين:

أول راتب إجمالي بعد التعيين: أتوقع أن يكون حوالي.....دينار شهريا

(٢٤) افرض انك لم لا تريد التوقف عن التعليم بعد التوجيهي و حصلت على عمل بعد التعليم العالي , ماذا تتوقع أن يكون راتبك الإجمالي بعد التعيين بالمتوسط شهريا:

أول راتب إجمالي بعد التعيين: أتوقع أن يكون حوالي.....دينار شهريا

(انتهى الاستبيان)
(شكرا جزئلاً على المشاركة الثمينة)

APPENDIX 3
Questionnaire for secondary school students
(English version)

Dear student,

The attached questionnaire is part of a study conduct by Ibrahim Alhawarin concerning the demand for HE in Jordan and mainly aims to collect data about the variables influencing the latter.

The data sought from the questionnaire is of great importance and will be solely used for scientific research purposes. Your honest and accurate answers will be greatly appreciated by the researcher and his university and actually are of great significance to the success of the research. Thus, it will be greatly appreciated if you could answer all the questions as indicated.

The questionnaire is anonymous, confidential, and no individual will be identified in the research. Participation in this questionnaire is completely voluntary and you also have the right to withdraw participation at any time or disregard any question you would like not to answer. The questionnaire (the Arabic version) consists of 6 pages (including this introduction).

During your participation or after you have completed the questionnaire, if you have any queries or comments; please do not hesitate to contact the researcher either directly or in writing on the back of the last page of the questionnaire.

The researcher: Ibrahim Mohammad Alhawarin
University of Northumbria-Newcastle upon Tyne- The UK
Researcher's details: mobile phone 077485051
ibrahim.alhawarin@unn.ac.uk

Part One contains 8 questions

In this part, we would like to know some background information about you. Note that some questions need you to tick a box as appropriate ☑, while others require you to write down your answers in gaps provided with questions.

1. What is your sex?

1. ☐ Male
2. ☐ Female

2. What is your academic stream?

1. ☐ Scientific
2. ☐ Arts
3. ☐ Information Management

3. What was your average of marks in the previous semester?

It was.....%

4. What is your father's level of education?

1. ☐ Illiterate
2. ☐ Elementary
3. ☐ Basic
4. ☐ Secondary
5. ☐ Intermediate Diploma
6. ☐ University and higher

5. What is your mother's level of education?

1. ☐ Illiterate
2. ☐ Elementary
3. ☐ Basic
4. ☐ Secondary
5. ☐ Intermediate Diploma
6. ☐ University and higher

6. How many sisters and brothers do you have?

Number of sisters is.....

Number of brothers is.....

7. How many of your brothers and sister are in HE (university or community college educations)?

Number of brothers in higher education is.....

Number of sisters in higher education is.....

8. What is your family's approximate monthly income?

1. ☐ Less than JD 250
2. ☐ between 250 and 299
3. ☐ between 300 and 349
4. ☐ between 350 and 399
5. ☐ between 400 and 449
6. ☐ between 450 and 499
7. ☐ between 500 and 550
8. ☐ More than JD 550

Part Two contains 11 statements

This part contains 11 statements expressing some opinions and positions. Please indicate to what extent each statement applies in your case by choosing one of the scale options (fully applicable to me, applicable to a great extent, somewhat applicable, applicable to a small extent, not at all applicable). Please tick one answer for each statement.

	Fully applicable to me	Applicable to a great extent	Somewhat applicable	Applicable to a small extent	Not at all applicable
(9) In my opinion, more education after the secondary stage helps in decreasing the period of time needed to get employed.	❑	❑	❑	❑	❑
(10) I believe that, even without higher education, I can get a good job.	❑	❑	❑	❑	❑
(11) I do not mind working in socially-considered low-status jobs.	❑	❑	❑	❑	❑
(12) I like working in office jobs more than working in manual or vocational jobs.	❑	❑	❑	❑	❑
(13) I think my parents and relatives can help me in employment by utilising their social links.	❑	❑	❑	❑	❑
(14) My parents have considerable influence on my decisions about my future.	❑	❑	❑	❑	❑
(15) My teachers have influenced my post- secondary decisions.	❑	❑	❑	❑	❑
(16) My friends have influenced my decisions on the post-secondary education stage.	❑	❑	❑	❑	❑
(17) I believe that a student's HE life is enjoyable and interesting	❑	❑	❑	❑	❑
(18) Socially, I perceive that people in Jordan give more respect to those bearing HE certificates.	❑	❑	❑	❑	❑
(19) In my opinion, being in HE benefits people socially by meeting new friends and learning new things about others' cultures.	❑	❑	❑	❑	❑

Part Three: contains 1 question

20. **As you are in the final secondary year, what do you expect to do after you finish your GSEC taking into account your current economic and academic situation? Please tick the most likely alternative from the following:**

1. ☐ After this stage, I will continue into higher education

2. ☐ After this stage, I will seek employment

3. ☐ Others (please specify):.....

If your answer in Q 20 is number 1, please answer part 4 only and then return the questionnaire.
If your answer is number 2, please skip part 4 and just answer part 5 and then return the questionnaire.
If your answer is number 3, please return the questionnaire now

Part four: contains 8 questions

21. **What is the most preferred HE specialization you want to study?**

.....

22. **At which higher education institution would you like to study your preferred specialisation (please name it):**
.....

If your preferred institution is private, please go to question 24 and do not answer question 23.

23. **If you do not get your most preferred specialization at one of the public universities, what would be the second most likely option for you?**

1. ☐ Accept to study another specialization but at a public higher education institution

2. ☐ Study my preferred specialization at one of the private HE institutions in Jordan

3. ☐ Study my preferred specialization abroad

4. ☐ Other (Please specify):.....

24. **What is the job you would most prefer to have after you complete your intended higher education specialisation?**.....

25. **Would you prefer to work in the public sector or the private sector?**

1. ☐ Private sector
2. ☐ Public sector

26. **As you report above that you are most likely continuing into HE, how much money do you expect to earn monthly (gross starting salary) supposing that you will have employment with the HE field you most prefer?**

The gross starting salary I expect to earn monthly is **JD**..... per month

27. **Suppose that you were not continuing into HE and would have employment only with the GSEC instead. How much money would you expect to earn on average monthly (gross starting salary)?**

The gross starting salary I expect to earn monthly is: **JD**.....per month

28. **Could you please tell us how long it might take you to get employment if you search with your most preferred specialisation?**

1. ☐ No time at all
2. ☐ It could take a short time
3. ☐ It could take some time
4. ☐ It could take a long time
5. ☐ It could take a very long time

Part five: contains 4 question

21. **What is the job you would most prefer to have after you complete your GSEC?**

.....

22. **Would you prefer to work in the public sector or the private sector?**

1. ☐ Private sector
2. ☐ Public sector

23. **As you report above that you are most likely not to continue into HE and will search for employment, how much money do you expect to earn monthly (gross starting salary) supposing you will have employment with only the GSEC?**

The gross starting salary I expect to earn monthly is **JD**..... per month

24. **Suppose that you were not terminating your education after the GSEC and would have employment with HE instead. How much money would you expect to earn on average monthly (gross starting salary)?**

The gross starting salary I expect to earn monthly is: **JD**.....per month

(The questionnaire ends)

Thank you very much for your participation in this study

APPENDIX 4
Student Consent Form
(Arabic and English versions)

نموذج موافقة طالب

عنوان الدراسة: العوامل المؤثرة في الطلب على التعليم العالي في الأردن

الباحث: إبراهيم محمد الهوا رين

الجامعة: نورثامبريا-نيوكاسل-المملكة المتحدة

هدف الدراسة: تهدف الدراسة لبحث مختلف المتغيرات الاقتصادية المباشرة و غير المباشرة بالإضافة لغير الاقتصادية المؤثرة في قرار الأفراد فيما يتعلق بالطلب على التعليم العالي في الأردن.

طريقة جمع معلومات البحث: بالإضافة لعدة مصادر أخرى للمعلومات, تعتمد الدراسة على جمع معلومات من طلبة الثانوية العامة في الفصلين الثالث و الرابع عن طريق استبيان يوزع على بعض الشعب في مدرستك وفي مدارس ثانوية أخرى في المحافظة (محافظة الكرك).

مخاطر البحث: لا يوجد في البحث أي مخاطر

منافع البحث: المنفعة المباشرة للبحث تكمن في توفير عمل بحثي يسند الباحثين و متخذي القرار فيما يتعلق في فهم الطلب على التعليم العالي في الأردن. الدراسة من المتوقع أن تقدم بعض التوصيات لمتخذي القرار في كيفية استعمال الأدوات الاقتصادية في توجيه التعليم العالي.

الوقت اللازم للاجا به على الاستبيان: على اكثر تقدير يحتاج ل حوالي 35 دقيقة.

طبيعة المشاركة: المشاركة في هذا الاستبيان اختيارية و يحق لأي طالب رفض المشاركة في الدراسة. لك الحق أيضا أن تنسحب من الدراسة في أي مرحلة ولك الحق أن لا تجيب على أي سؤال لا ترغب بالإجابة عليه.

سرية المعلومات: الاستبيان بشكل مطلق لا يتطلب منك أن تكتب اسمك أو أي معلومة قد تدلل عليك في أي جزء منه.

نص الموفقة: لقد اطلعت بشكل كامل على هدف الدراسة, و طريقة جمع المعلومات, و منافعها و مخاطرها. لذلك أود المشاركة في هذه الدراسة فيما يتعلق بالا جابه على الاستبيان. أفوض الباحث أيضا باستخدام معلومات الاستبيان من أجل تحقيق أهداف هذه الدراسة و أفوضه باستخدامها للأغراض البحثية الأكاديمية المتعلقة بدراسته في المستقبل.

اسم الطالب:

التوقيع:

ملاحظة: هذا النموذج ليس جزءا من الاستبيان و سوف يحفظ بمعزل عنه

Student Consent Form

Title of study: Factors affecting student demand for higher education in Jordan

Principal investigator: Ibrahim Alhawarin

University: The University of Northumbria at Newcastle- UK

Purpose of the research: This study is intended to investigate the impact of various socio-economic variables on post-secondary educational decisions.

Procedures for this research: Data are being collected using a questionnaire survey. Questionnaires are being disseminated to each student in a selected number of classes at your schools and other secondary schools within AlKarak governorate.

Potential Risks or Discomfort: There are no foreseeable risks or discomfort associated with the study.

Potential Benefits of the research: the direct benefit of the study would be the availability of published work on how individuals make their decisions on the post-secondary stage and the availability of rich findings for public and private decisions makers. The study therefore is of great importance form both the academic and policy making perspectives.

Time to complete the questionnaire: Maximum time required to complete the questionnaire (including this consent form) will not exceed 35 minutes.

Alternative procedures: Participation in this research is entirely voluntary and you may withdraw consent and terminate participation at any time without consequence.

Protection of confidentiality: You will not be required to place your name anywhere on the survey instrument. The questionnaire is completely anonymous.

Statement of Consent: I have been fully informed about the purposes, procedures, benefits and risks of the above-mentioned study. I therefore agree to participate in it and agree the researcher to use the data collected for research purposes in this study and in the future.

Name in print:

Signature:

Notice: This document is not a part of the questionnaire and will be kept separately from your answered questionnaire.

APPENDIX 5

Average tuition fees for HE major specialisations in public universities (Pus) in (2004) and private universities (VUs) in 2006.

Administrative and Social Sciences (PUs)

Specialisation	Average Credit Hour Fee (JD rounded)
Business adm.	15
Accounting	20
Accounting and commercial Law	20
Finance	20
Marketing	15
Public adm.	10
Sociology	10
Economics	15
Politics	10
Bank adm.	25
Water, land and environment Adm.	30
Risk and insurance management	20
International relations and strategic studies	25
Hotel adm.	25
Tourism Guidance	25
Museums Adm.	25
International business	20
Law	10
Business and financial Economics	25
Islamic Banking and Economics	10
Urban Planning	35
Library adm.	35
Social service	16
Administrative information systems	30

*Adm. abbreviates administration.

Arts and Humanities (PUs)

Specialisation	Average Credit Hour Fee (JD rounded)
Arabic Language	10
English Language	15
Other Languages	10
Translation	12
Islamic religious studies	10
Special education	15
Physiology	12
Physiological health and guidance	15
Physical education	15
Physical upgrading	20
Physical training and adm.	20
History	10
Archaeology	15
Geography	10
Philosophy	12
Press and Media	10
Anthropology	10
Child Education	20
Class education	15
Cultural studies	25
Islamic Art	35
Arts	20
Vocational Education	16

Sciences (PUs)

Specialisation	Average Credit Hour Fee (JD rounded)
Mathematics	20
Physics	18
Chemical sciences	18
Biology	15
Geology	15
Agricultural Sciences	20
Computer sciences	30
Statistics	15
Environmental science	30

Nursing, Medical and Pharmaceutical Sciences (PUs)

Specialisation	Average Credit Hour Fee (JD rounded)
Clinical medicine	55
Veterinary medicine	30
Nursing	20
Medical laboratories	35
Dentistry	40
Dental cosmetics and manufacturing technology	30
Pharmaceutical science	30
Physiotherapy	30
Rays technology	30
Midwifery	30
Cosmetics	30
Health service Adm.	30
Eye technology	30
Eye medical	35

Engineering (PUs)

Specialisation	Average Credit Hour Fee (JD rounded)
Civil Engineering	20
Architecture Engineering	20
Electrical Engineering	30
Mechanical Engineering	30
Chemical Engineering	20
Industrial Engineering	25
Computer Engineering	35
Communication Engineering	20
Genetic Engineering	30
Medical Engineering	30
Technological and agricultural Engineering	20
Geometric Engineering	45

Source: *Ministry of Higher Education and Scientific Research*

Administrative and Social Sciences (VUs)

Specialisation	Average Credit Hour Fee (JD rounded)
Business adm.	60
Accounting	60
Accounting and commercial Law	NA
Finance	60
Marketing	55
Public adm.	NA
Sociology	NA
Economics	NA
Politics	NA
Bank adm.	NA
Water, land and environment Adm.	NA
Risk and insurance management	NA
International relations and strategic studies	NA
Hotel adm.	67
Tourism Guidance	67
Museums Adm.	NA
International business	NA
Law	67
Business and financial Economics	NA
Islamic Banking and Economics	NA
Urban Planning	NA
Library adm.	NA
Social service	NA
Administrative information systems	58

Arts and Humanities (VUs)

Specialisation	Average Credit Hour Fee (JD rounded)
Arabic Language	45
English Language	60
Other Languages	50
Translation	50
Islamic religious studies	NA
Special education	67
Physiology	NA
Physiological health and guidance	67
Physical education	50
Physical upgrading	50
Physical training and adm.	50
History	NA
Archaeology	NA
Geography	NA
Philosophy	NA
Press and Media	60
Anthropology	NA
Child Education	55
Class education	55
Cultural studies	NA
Islamic Art	NA
Arts	81
Vocational Education	NA

Sciences (VUs)

Specialisation	Average Credit Hour Fee (JD rounded)
Mathematics	NA
Physics	NA
Chemical sciences	45
Biology	NA
Geology	NA
Agricultural Sciences	45
Computer sciences	66
Statistics	NA
Environmental science	NA

Nursing, Medical and Pharmaceutical Sciences (VUs)

Specialisation	Average Credit Hour Fee (JD rounded)
Clinical medicine	NA
Veterinary medicine	NA
Nursing	NA
Medical laboratories	78
Dentistry	NA
Dental cosmetics and manufacturing technology	NA
Pharmaceutical science	86
Physiotherapy	78
Rays technology	NA
Midwifery	NA
Cosmetics	NA
Health service Adm.	NA
Eye technology	NA
Eye medical	NA

Engineering (VUs)

Specialisation	Average Credit Hour Fee (JD rounded)
Civil Engineering	NA
Architecture Engineering	78
Electrical Engineering	75
Mechanical Engineering	NA
Chemical Engineering	NA
Industrial Engineering	NA
Computer Engineering	80
Communication Engineering	85
Genetic Engineering	NA
Medical Engineering	94
Technological and agricultural Engineering	NA
Geometric Engineering	NA

Source: *Data represent the situation in three of the biggest and oldest private universities in Jordan. These are Al-Isra Private University ,(http://www.ipu.edu.jo/), University of Petra (http://www.uop.edu.jo/), and Al-Ahliyya Amman University (http://www.amman.edu/). Data are averaged. NA=the subject is not available.*

APPENDIX 6

Official letters

بسم الله الرحمن الرحيم

AL-HUSSEIN BIN TALAL UNIVERSITY

Office of the President

جامعة الحسين بن طلال

مكتب الرئيس

الرقم : ...

Ref. : ...

التاريخ : ...

Date : ...

معالي الدكتور خالد طوقان المحترم

وزير التربية والتعليم

تحية طيبة، وبعد:

أرجو معاليكم التلطف بالعلم أن السيد إبراهيم محمد حامد الهوارين هو أحد موفدي جامعة الحسين بن طلال إلى جامعة نورثمبريا / نيوكاسل / بريطانيا لنيل درجة الدكتوراه في الاقتصاد الجزئي.

راجياً التكرم بالموافقة والإيعاز لمن يلزم في مديريات التربية والتعليم للسماح للموفد المذكور إجراء دراسته الميدانية والمتعلقة بموضوع دراسة " **العوامل المؤثرة في الطلب على التعليم العالي في الأردن : وجهة نظر اقتصادية** "، وذلك خلال الفترة من ١٢ / ٢ / ٢٠٠٥ - ١٧ / ٤ / ٢٠٠٥، كون هذه الدراسة الميدانية تشكل جزءاً رئيسياً من دراسته لدرجة الدكتوراه.

مغتنماً هذه المناسبة لأعرب لمعاليكم عن خالص الشكر والتقدير.

وتفضلوا معاليكم بقبول وافر الاحترام ،،،

رئيس الجامعة

الدكتور راتب العوران

المملكة الأردنية الهاشمية
ديوان الخدمة المدنية
الرقم ...
١٦ آب ٢٠٠٥
المدير / رئيس قسم ...

Visit the University site on the web at: http://www.ahu.edu.jo

Our e-mail address is : president@ahu.edu.jo

هاتف : ٠٣/٢١٧٩٠٠٠ فاكس : ٠٣/٢١٧٩٠٥٠ - ص.ب (٢٠) معان - الأردن

Tel. 962-3-2179000, Fax. : 962-3-2179050, P. O. Box : (20) Ma'an - Jordan

بسم الله الرحمن الرحيم

وزارة التربيـــة والتعليـــم

الرقم ١٠/٣ التاريخ ٢٤٢٦/١ الموافق ٢٠٠٥/٢

السيد مدير التربية والتعليم لمنطقة الكرك
السيد مدير التربية والتعليم لمنطقة القصر
السيد مدير التربية والتعليم للواء المزار الجنوبي
السيد مدير التربية والتعليم للواء الاغوار الجنوبية

الموضوع : البحث التربوي

السلام عليكم ورحمة الله وبركاته،

يقوم الطالب إبراهيم محمد حامد الهوارين بإعداد دراسة بعنوان"العوامل المؤثرة في الطلب علـى التعلـيم العالي في الاردن: وجهة نظر اقتصادية". وذلك استكمالاً لمتطلبات الحصول على درجـة الـدكتوراة في تخصـص الاقتصاد الجزئي من جامعة نور ثمبريا Northumbria في بريطانيا ، ويحتاج ذلك إلى تطبيق اسـتبانة علـى عينة من طلبة الصف الثاني الثانوي في المدارس التابعة لمديريتكم .

يرجى تسهيل مهمة الطالب المذكور وتقديم المساعدة الممكنة له .

مع وافر الاحترام

وزير التربية والتعليم
نعمى فائق العديلي
مدير المطبوعات التربوية

نسخة/ للسيد رئيس قسم البحث التربوي
نسخة / للملف ١٠/٣

هاتف : ٥٦٠٧١٨١ / ١١ فاكس : ٥٦٦٦٠١٩ ص . ب (١٦٤٦)

قرار رقم ١١١ / ٢٠٠٣

بسم الله الرحمن الرحيم

نموذج موافقة مدير المدرسة

بعد الاطلاع على كتاب معالي وزير التربية و التعليم رقم (٧٤٩٣/١٠/٢) تاريخ ١٦ / ٨ /٢٠٠٥م ، و الاطلاع على جميع الوثائق (من استبيان، موافقات و كتب التغطية) المتعلقة بالدراسة الميدانية " العوامل المؤثرة في الطلب على التعليم العالي في الأردن : وجهة نظر اقتصادية" للباحث إبراهيم الهوارين من جامعة نورثامبريا-المملكة المتحدة قرر مدير المدرسة الموافقة على السماح للباحث بتوزيع استبيان دراسته على طلبة الثاني ثانوي الأكاديمي (الفصل الرابع) في المدرسة.

اسم المدير: طارق سعد الحياري

اسم المدرسة: الطفرة الثانوية للبنين

التاريخ: ٢٠٠٥/٨/٢٣

التوقيع و ختم المدرسة:

APPENDIX 7
Stepwise and simultaneous estimations of *log* expected starting earnings

Table A.1: Results of the stepwise OLS estimation of the *log* of expected starting earnings (pooled for the sample, N=708)*

Variable*	Coefficient	t-statistics	*p* value
(Constant)	2.204	315.051	0.000
Sex (Female=0)	0.021	2.951	0.003
Post-secondary decision (0=Search for employment)	0.171	22.282	0.000
Family monthly income (less than 250=0)			
≥JD 550	0.032	1.973	0.049
Model Summary statistics:			
R^2	0.427		
Adjusted R^2	0.425		
F-statistics	175.000		
p value (F-statistics)	0.000		

* Dependent variable represents the *log* of responses on variables 1ES and 1EH Table 7.1. See Table A.2 for simultaneous model. *The variance inflation factor (VIF) values for all independent variables were less than 3.

Table A.2: Results of the simultaneous OLS estimation of the *log* expected starting earnings (pooled for the sample N=708)

Variable*	Coefficient	t-statistics	*p* value
(Constant)	2.179	74.071	0.000
Post-secondary decision (search for employment=0)	0.168	20.256	0.000
Sex (Female=0)	12.471	2.830	0.005
Sector preferred for employment (Private=0)	0.010	1.105	0.270
Average of marks	0.001	1.465	0.143
Family monthly income (Less than 250=0)			
≥JD 250 ≤ JD 299	0.007	0.658	0.511
≥JD 300 ≤ JD 349	0.007	0.577	0.564
≥JD 350 ≤ JD 399	-0.002	-0.150	0.881
≥JD 400 ≤ JD 449	0.020	1.240	0.215
≥JD 450 ≤ JD 499	0.006	0.325	0.745
≥JD 500 ≤ JD 549	0.015	0.711	0.477
≥JD 550	0.030	1.596	0.111
Area of residence (Urban=0)			
Rural	-0.013	-1.428	0.154
Nomadic	-0.019	-1.834	0.067
Father's education (Illiterate=0)			
Elementary	0.000	-0.028	0.977
Basic	-0.002	-0.183	0.855
Secondary	-0.007	-0.488	0.626
I. Diploma	-0.002	-0.134	0.894
University and higher	-0.012	-0.679	0.497
Mother's education (Illiterate=0)			
Elementary	0.004	0.266	0.790
Basic	-0.012	-0.923	0.356
Secondary	0.011	0.922	0.357
I. Diploma	0.000	-0.025	0.980
University and higher	0.011	0.482	0.630
Model Summary statistics:			
R^2	0.440		
Adjusted R^2	0.421		
F-statistics	23.361		
p value (F-statistics)	0.000		

*Dependent variable represents the *log* of responses on variables 1ES and 1EH Table 7.1. *The variance inflation factor (VIF) values for all independent variables were less than 3

Table A.3: Results of the stepwise OLS estimation of the *log* expected starting earnings for HE field groups (sample N=487)*

Variable**	Coefficient	t-statistics	*p* value
(Constant)	2.607	274.216	0.000
HE preferred field (General medicine =0)			
Dentistry & others	-0.013	-1.125	0.261
Engineering	-0.090	-9.347	0.000
Nursing	-0.128	-11.490	0.000
Agr. Engineering &geology	-0.121	-9.755	0.000
Education fields	-0.221	-24.392	0.000
Other university fields	-0.249	-27.653	0.000
Community college	-0.346	-38.283	0.000
Sector preferred for employment (Private=0)	0.009	1.938	0.053
Area of residence (Urban=0)			
Rural	-0.025	-6.033	0.000
Nomadic	-0.035	-7.001	0.000
Sex (Female=0)	-0.002	-0.546	0.585
Model Summary statistics:			
R^2	0.883		
Adjusted R^2	0.880		
F-statistics	311.660		
p value (F-statistics)	0.000		

*Dependent variable represents the *log* of responses on variables 1EH Table 7.1. See Table A.4 for simultaneous model. **The variance inflation factor (VIF) values for all independent variables were less than 5.

Table A.4 : Results of the simultaneous OLS estimation of the *log* expected starting earnings for HE field groups (sample N=487)

Variable*	Coefficient	t-statistics	*p* value
(Constant)	2.588	146.514	0.000
HE preferred field (General medicine =0)			
Dentistry & others	-0.012	-1.060	0.290
Engineering	-0.091	-9.302	0.000
Nursing	-0.128	-11.277	0.000
Agr. Engineering & geology	-0.124	-9.774	0.000
Education fields	-0.222	-24.068	0.000
Other university fields	-0.252	-27.533	0.000
Community college	-0.348	-37.897	0.000
Sector preferred for employment (Private=0)	0.009	1.854	0.064
Area of residence (Urban=0)			
Rural	-0.025	-5.279	0.000
Nomadic	-0.036	-6.267	0.000
Average of Marks	0.000	1.838	0.067
Family monthly income (Less than 250=0)			
≥JD 250 ≤ JD 299	0.002	0.392	0.695
≥JD 300 ≤ JD 349	-0.005	-0.794	0.427
≥JD 350 ≤ JD 399	0.000	0.012	0.990
≥JD 400 ≤ JD 449	-0.008	-1.008	0.314
≥JD 450 ≤ JD 499	-0.003	-0.423	0.672
≥JD 500 ≤ JD 549	-0.016	-1.556	0.120
≥JD 550	-0.008	-0.832	0.406
Father's education (Illiterate=0)			
Elementary	-0.008	-1.023	0.307
Basic	-0.010	-1.556	0.121
Secondary	-0.012	-1.716	0.087
I. Diploma	-0.010	-1.174	0.241
University and higher	-0.001	-0.061	0.952
Mother's education (Illiterate=0)			
Elementary	-0.003	-0.412	0.681
Basic	0.007	1.036	0.301
Secondary	0.007	1.193	0.233
I. Diploma	0.005	0.696	0.487
University and higher	-0.002	-0.168	0.866
Sex (Female=0)	-0.001	-0.220	0.826
Model Summary statistics:			
R^2	0.888		
Adjusted R^2	0.88		
F-statistics	118.444		
p value (F-statistics)	0.000		

*Dependent variable represents the *log* of the responses on variables 1EH Table 7.1. *The variance inflation factor (VIF) values for all independent variables were less than 5.

Table A.5: Results of the stepwise OLS estimation of the *log* expected starting earnings for secondary education (sample N=708)

Variable**	Coefficient	t-statistics	*p* value
(Constant)	2.246	114.768	0.000
Sex (Female=0)	0.028	5.371	0.000
Area of residence (Urban=0)			
Rural	-0.031	-5.288	0.000
Nomadic	-0.052	-7.667	0.000
Average of marks	-0.001	-2.297	0.022
Family monthly income (Less than 250=0)			
≥JD 300 < JD 349	-0.033	-4.177	0.000
Father's education (Illiterate=0)			
Secondary	-0.015	-4.177	0.000
Model Summary statistics:			
R^2	0.151		
Adjusted R^2	0.141		
F-statistics	20.751		
p value (F-statistics)	0.000		

* Dependent variable represents the *log* of responses on variables 1ES and 2ES Table 7.1. See Table A.6 for simultaneous model.**The variance inflation factor (VIF) values for all independent variables were less than 3.

Table A.6: Results of the simultaneous OLS estimation of the *log* expected starting earnings for secondary education (sample N=708)

Variable*	Coefficient	t-statistics	*p* value
(Constant)	2.246	108.314	0.000
Sex (Female=0)	0.030	5.483	0.000
Sector preferred for employment (Private=0)	-0.012	-1.850	0.065
Average of marks	0.000	-1.814	0.070
Family monthly income (Less than 250=0)			
≥JD 250 < JD 299	-0.001	-0.181	0.857
≥JD 300 < JD 349	-0.036	-4.126	0.000
≥JD 350 < JD 399	0.000	-0.011	0.991
≥JD 400 < JD 449	-0.019	-1.738	0.083
≥JD 450 < JD 499	-0.014	-1.215	0.225
≥JD 500 < JD 549	0.001	0.047	0.963
≥JD 550	0.004	0.290	0.772
Area of residence (Urban=0)			
Rural	-0.032	-5.289	0.000
Nomadic	-0.050	-6.728	0.000
Father's education (Illiterate=0)			
Elementary	0.014	1.349	0.178
Basic	-0.008	-0.902	0.367
Secondary	0.010	1.014	0.311
I. Diploma	0.008	0.664	0.507
University and higher	-0.003	-0.275	0.783
Mother's education (Illiterate=0)			
Elementary	0.002	0.219	0.827
Basic	-0.006	-0.630	0.529
Secondary	-0.002	-0.229	0.819
I. Diploma	-0.001	-0.122	0.903
University and higher	-0.003	-0.186	0.853
Model Summary statistics:			
R^2	0.167		
Adjusted R^2	0.140		
F-statistics	6.249		
p value (F-statistics)	0.000		

* Dependent variable represents the *log* responses on variables 1ES and 2ES Table 7.1. *The variance inflation factor (VIF) values for all independent variables were less than 4.

Table A.7: Results of the stepwise OLS estimation of the *log* expected starting earnings for HE (sample N=708)

Variable*	Coefficient	t-statistics	*p* value
(Constant)	2.275	74.828	0.000
Sex (Female=0)	0.016	1.975	0.049
Area of residence (Urban=0)			
Rural	-0.023	-2.473	0.014
Nomadic	-0.044	-4.140	0.000
Average of marks	0.001	3.627	0.000
Model Summary statistics:			
R2	0.046		
Adjusted R2	0.041		
F-statistics	8.497		
p value (F-statistics)	0.000		

* Dependent variable represents the *log* responses on variables 1EH and 2EH Table 7.1. See Table A.8 for simultaneous model. *The variance inflation factor (VIF) values for all independent variables were less than 2

Table A.8: Results of the simultaneous OLS estimation of the *log* expected starting earnings for HE (sample N=708)

Variable*	Coefficient	t-statistics	*p* value
(Constant)	2.269	68.821	0.000
Sex (Female=0)	0.017	1.949	0.052
Sector preferred for employment (Private=0)	-0.017	-1.677	0.094
Average of marks	0.001	3.538	0.000
Family Income (Less than 250=0)			
≥JD 250 ≤ JD 299	0.003	0.229	0.819
≥JD 300 ≤ JD 349	0.014	1.032	0.302
≥JD 350 ≤ JD 399	-0.007	-0.389	0.697
≥JD 400 ≤ JD 449	0.033	1.866	0.063
≥JD 450 ≤ JD 499	0.004	0.206	0.837
≥JD 500 ≤ JD 549	0.019	0.783	0.434
≥JD 550	0.016	0.746	0.456
Area of residence (Urban=0)			
Rural	-0.020	-2.008	0.045
Nomadic	-0.039	-3.306	0.001
Father's education (Illiterate=0)			
Elementary	0.001	0.079	0.937
Basic	0.019	1.316	0.189
Secondary	0.003	0.210	0.834
I. Diploma	0.010	0.512	0.609
University and higher	0.001	0.041	0.967
Mother's education (Illiterate=0)			
Elementary	-0.004	-0.269	0.788
Basic	-0.017	-1.205	0.229
Secondary	0.011	0.838	0.402
I. Diploma	0.000	-0.002	0.999
University and higher	-0.002	-0.077	0.939
Model Summary statistics:			
R^2	0.066		
Adjusted R^2	0.036		
F-statistics	2.208		
p value (F-statistics)	0.001		

*Dependent variable represents the *log* responses on variables 1EH and 2EH Table 7.1 * The variance inflation factor (VIF) values for all independent variables were less than 4.